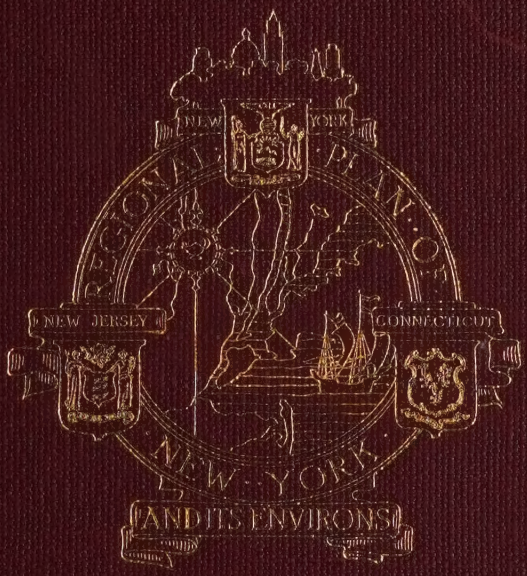
NEW YORK
NEW JERSEY
CONNECTICUT
NEW YORK
AND ITS ENVIRONS

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REGIONAL PLAN OF NEW YORK
AND ITS ENVIRONS

Volume One

THE GRAPHIC REGIONAL PLAN

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COMMITTEE ON
REGIONAL PLAN OF NEW YORK
AND ITS ENVIRONS

WM. F. FELL CO. PRINTERS
PHILADELPHIA

NEW YORK—LOOKING SOUTH

Painted for the Regional Plan of New York by Jules Guerin

ACROSS THE CENTER OF THE REGION

THE GRAPHIC REGIONAL PLAN

ATLAS AND DESCRIPTION

REGIONAL PLAN
VOLUME ONE

Prepared by the Staff of the Regional Plan

NEW YORK
REGIONAL PLAN OF NEW YORK
AND ITS ENVIRONS
1929

REGIONAL PLAN OF NEW YORK AND ITS ENVIRONS

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vol.1

To the Memory of

CHARLES DYER NORTON

THE FIRST CHAIRMAN OF THE
COMMITTEE ON THE REGIONAL
PLAN OF NEW YORK AND ITS
ENVIRONS

IN APPRECIATION OF HIS
COMPELLING ENTHUSIASM,
ENERGY AND LEADERSHIP,
THESE VOLUMES, CARRYING
FORWARD THE WORK FOR
WHICH HIS VISION SAW THE
NEED, ARE DEDICATED BY
HIS COLLEAGUES

Photo by William Frange

LONG ISLAND, FROM THE CENTER OF NEW YORK HARBOR

LETTER OF PRESENTATION

THE staff of the Committee on a Regional Plan has now completed not only its surveys but the Plan itself. To this end all its studies and labors have been directed. The Plan is set forth in this and another volume that follows it. The Committee now presents these to the public.

The purpose of these volumes is to supply an analysis of the physical needs of the New York region and a conception of a way to meet them. Only by the aid of such a conception can a community structure, sound in all its parts, be achieved. Circulation by all forms of conveyance into, out of, and within the Region, and the location of industry, commerce, business, residence and recreation—these are fundamental elements upon the treatment of which the soundness of the physical development of a city or metropolitan region depends. Thus land uses and communications of all

sorts are the subjects treated in this first volume of the Regional Plan. The treatment is in the form of a graphic presentation of proposals, illustrated on the Atlas and descriptively summarized in the text that follows. These proposals will be found to furnish a general outline of the needs of the Region in respect to circulation and an indication of the adaptability to various uses of its different parts.

In the second volume will be found discussions and illustrations of principles that should govern the development of the Plan in some detail; also an exposition of ancillary projects that offer concrete evidence of its possibilities; and finally certain suggestions respecting the architectural design and the arrangement of buildings.

It will bear emphasizing that it is to the public that the Plan is presented. Those who have been engaged upon its preparation have realized from the beginning that they have no power to impose their ideas on the community and that all they can do is to bring forward well-reasoned proposals in the hope that these may arouse interest and commend themselves to public opinion and to the judgment of experts.

The history of this enterprise has been told on many occasions. It has taken more time — a total of seven years since being inaugurated — and has cost considerably more — a total of about one million dollars — than was originally expected.

It was Mr. Charles D. Norton's vision that saw the need of a regional plan for New York and its environs, and his enthusiasm that launched the project. Nothing of the kind had ever been undertaken on such a scale before. The quantity and variety of the detail that seemed to call for consideration were almost terrifying. A technical approach to the study of the Region's complex structure and complicated functioning had to be devised and put into operation. To pretend that nothing would be done differently if it were done again would be absurd. But now that the work is completed, the Committee finds satisfaction in the reflection that were it to begin again in the light of what it has learned, it would not ask the staff to depart radically from the methods it has employed.

If the work were to be repeated, we would not alter our definition of the Region's size. We should proceed with even more confidence than we did

at the outset upon the theory that economic, legal and social studies are indispensable preliminaries and complements to the work of engineers and architects in preparation for graphic planning. We should have more courage than any one but Mr. Norton had originally, for we are more thoroughly aware than we were six years ago of the need of such a work, and more confident of enjoying co-operation and encouragement.

During the progress of the work certain facts have been brought home to every one who has been concerned with it. One is that public officials, semi-public agencies, like chambers of commerce, newspapers and the public generally, have manifested nothing less than cordial interest in the enterprise from the beginning. Such good will, made evident in countless ways before the completion of the Plan, seems to prove that intelligent people in the New York region are already aware that the future growth of the community must be more deliberately and more boldly planned than it has been in the past.

Another fact that has been brought home to us all is the importance of what might be called cordial team-play between New York and New Jersey. Fortunately we can say that we have met with many signs of willingness on both sides of the Hudson to recognize the interdependence of the two sides of the Port and the two halves of the metropolitan community. It is to be hoped that the two will work ever more closely together.

In a sense the preliminary surveys and the final Plan stand together. These two volumes called the Plan rest upon the Survey. In the reports which embody the results of the survey—already published—there is a mass of factual material that supports the Plan. There are also numerous diagrams and many recommendations which are analogous to the contents of the plan volumes. Cross references are unavoidable in so considerable a body of discussions and recommendations.

Part of the staff during these years has not only been making surveys and a Plan, but has been aiding in the creation of local planning agencies throughout the Region, has engaged in public discussion and public education, and has in some instances aided legislation by assisting in the drafting of bills or the presentation of arguments. The staff has also been drawn into the dis-

cussion of various particular projects which were already on foot in the Region and has sometimes in connection with such projects made concrete proposals of its own. The fruits of these efforts are collateral to the Plan, but are not easily measured. The main purpose having been to interest the people of the New York region in planning, the presentation of a plan is but one, although the chief, means to the Committee's end. The promotion of intelligent discussion and the organization of local agencies have been regarded as other appropriate means to that end.

It would be difficult as well as invidious to make acknowledgments to members of the staff by name. The list of full-time workers and coadjutors is a long one.[1] Under the directorship of Mr. Thomas Adams the staff has worked in such a spirit of mutual co-operation that it would be hard to attribute any part of what has been accomplished to one person alone. Different chapters or volumes of the reports have been, to be sure, signed or initialed by individuals; but there has been consultation concerning everything and the Director of Plans and Surveys has been more or less responsible for a great deal that he has not signed.

In the death of Mr. Norton, chairman and leader of the enterprise, in 1923, both the Committee and the staff suffered a great loss. Mr. Nelson P. Lewis, who died in 1924, was responsible for organizing the staff's approach to its engineering studies, and was an adviser concerning the history and planning of the Region whom it was impossible to replace. Mr. Frederick P. Keppel, who served as secretary for a year in 1923 and has since acted as a consulting member of the Committee, had much to do with the devising of methods and procedures, and what has been accomplished during the ensuing years is in part to be credited to his skill. The Committee lost a member and wise counsellor when Mr. Alfred T. White, one of the original members, died in 1921.

With the publication of the Plan the original undertaking completes itself. The question remains what will be done with it, but that is a question which others must decide. It is encouraging to know, however, that a Regional Planning Association has already been incorporated in order to do what it can to develop sound planning in the Region. It is to be hoped that

[1] See pages 12, 13 and 14.

this association and other similar agencies will find themselves adopting or supporting recommendations and projects that our staff has put forward. We hope that our Committee may at least be able to maintain an office and a skeleton organization to interpret and make available to others the large and in some ways unique collection of material which has been gathered.

Frederic A. Delano, *Chairman*
Robert W. de Forest
John H. Finley
John M. Glenn
Henry James
George McAneny
Dwight W. Morrow
Frank L. Polk
Frederic B. Pratt
Lawson Purdy

ORGANIZATION OF WORK OF COMMITTEE

Staff of Plan—1923–1929

Administration[1] and General Direction of Plans and Surveys

Thomas Adams, General Director
Henry James, Consultant on Special Studies
Leslie S. Baker, Staff Secretary, 1923–28
Lawrence M. Orton, Secretary, 1928–29
Theodore T. McCrosky, Assistant on Special Studies
Frances Perry, Margaret A. Purdy, Lorraine C. Smith, Loretta P. Hendrick, Ruth A. Hemenway, Inez Price, Dorothy B. Morris, Cecile Randau

Engineering Division[2] and Planning Studies

William J. Wilgus, Consultant on Studies of Transportation and Port Development
Ernest P. Goodrich, Consultant on Traffic Studies
Daniel L. Turner, Consultant on Transit
Robert Whitten, Consultant on Planning Studies
Francis S. Swales, Consultant on Architectural Studies
Harold M. Lewis, Executive Engineer
Raymond A. O'Hara, Chief Assistant Engineer
Frederick W. Loede, Jr., Landscape Architect
C. Earl Morrow, Assistant Landscape Architect
George A. Schiller, Alfred Chanchik, Harry H. Hemmings, Harold A. Merrill, John Rannells, Kathryn M. Duffy, Lulu Fisher

Economic Division

Robert M. Haig, Director
Roswell C. McCrea, Consultant
Donald H. Davenport, Special Studies

Social Division

Shelby M. Harrison, Director
Lee F. Hanmer, Director of Recreation Studies
Clarence Arthur Perry
Charles J. Storey

Legal Division

Edward M. Bassett, Director
Frank B. Williams, Associate

Public Relations Division

Flavel Shurtleff, Director
Wayne D. Heydecker, Field Secretary
Meta D. Osmer, Hilda Reich

Advisory Committees

The Committee has been fortunate in obtaining advice from many eminent experts. Not only numerous individuals, but also groups of architects, engineers, lawyers and city planners have rendered valuable help. Members of the following committees have actively participated in making studies and plans or have freely given their time for the discussion of problems.

COMMITTEES OF ARCHITECTS

In 1923 advisory committees of architects generously gave their services in preparing drawings and plans dealing with specific areas and problems as follows:

1. City Hall and General Plan of Manhattan:
   Cass Gilbert, *Chairman*, Welles Bosworth, Guy Lowell,[3] Lawrence Grant White
2. East Side Waterfront:
   D. Everett Waid, *Chairman*, Chester H. Aldrich, Louis Ayres, John W. Cross, William A. Delano, Frederic C. Hirons, Henry F. Hornbostel, Egerton Swartwout
3. Fifty-ninth Street and Traffic Studies:
   Harvey W. Corbett, *Chairman*, William A. Boring, Arnold W. Brunner,[3] Burt L. Fenner,[3] Charles A. Platt
4. West Side Waterfront:
   Thomas Hastings, *Chairman*, Donn Barber,[3] Charles Butler, John Russell Pope

The following architects co-operated in the above studies:

Henry Dumper
Hugh Ferriss
William Gehron
Thomas Newton
Bruce Rabenold
Perry Coke Smith
Francis S. Swales

[1] Frederick P. Keppel was Executive Secretary of the Committee until September, 1923.
[2] The late Nelson P. Lewis was Director of the Engineering Studies prior to his death in March, 1924. [3] Now deceased.

ORGANIZATION OF WORK OF COMMITTEE

In October, 1922, Mr. Raymond Unwin, F.R.I.B.A., Chief Architect of the Ministry of Health, England, presented a report to the Committee on "New York and Its Environs as a Regional Planning Problem from a European Point of View."

M. Jacques Lambert, Architect, Paris, made a study of gardens and parks in Manhattan in 1923.

COMMITTEES OF ENGINEERS AND LAWYERS

The following committees have acted as consultants to the members of the staff in the engineering and legal divisions of the work:

ADVISORY ENGINEERING COMMITTEE:

B. F. Cresson, Jr.[1]	Charles W. Leavitt[1]	Charles U. Powell	Amos Schaeffer[1]	George C. Whipple[1]
Jay Downer	L. V. Morris	Arthur H. Pratt	Morris R. Sherrerd	William J. Wilgus
Ernest P. Goodrich	Frederick Law Olmsted	A. M. Reynolds	Daniel L. Turner	

ADVISORY LEGAL COMMITTEE:

James Byrne	Alfred T. Davison	Harrison P. Lindabury	Isaac N. Mills	Frank H. Sommer

ADVISORY PLANNING GROUP

During 1923 the following group of city planners made a preliminary path-finding study of the Region and prepared maps and reports dealing with land uses and means of circulation:

Thomas Adams, *Chairman;* assisted by Hale J. Walker
Harland Bartholomew; assisted by L. D. Tilton
Edward H. Bennett; assisted by H. T. Frost
George B. Ford; assisted by Ernest P. Goodrich
John Nolen; assisted by Philip W. Foster
Frederick Law Olmsted; assisted by Henry V. Hubbard

SPECIAL SERVICES

At different stages during the preparation of the Plan special services have been rendered for brief periods by the above and other experts, whose names are given, with the titles of the reports they presented, in the Regional Survey Volumes.

Regional Council

A Regional Council, composed of 150 individuals, largely representatives of planning agencies throughout the Region, was formed in April, 1925, and held several meetings in 1926 and 1927. The Committee on the Regional Plan appreciates the cordial co-operation and assistance of members of the Council.

Co-operation of Public Authorities in the Region

The Regional Plan Committee has been peculiarly successful in securing the generous collaboration of all the public authorities which have been approached for assistance in making surveys and plans. As a result of this collaboration, united action has been promoted in many cases with profitable results.

The bureaus of the three states that deal with problems relating to regional planning, and the State Highway Commissions have shown every willingness to co-operate. The Departments of Labor in the three states supplied the industrial data from which the conclusions of the Economic Survey have been drawn.

The City of New York and its various departments have at all times rendered willing aid to the Committee. Other cities, counties, boroughs, villages and towns have all shown a ready acquiescence in giving information and in assisting with the study of local conditions. During the period since May,

[1] Now deceased.

1924, there have been appointed in the Region a large number of new planning commissions, including the City Committee on Plan and Survey in New York City, and several county Park and Planning Commissions. This progress has been largely due to the work of organization of the staff of the Regional Plan which has aroused an increased public interest in regional, city and town planning.

The state, municipal and county authorities that have collaborated in making studies of problems and tentative plans, or in furnishing needed information, include the Port of New York Authority, the New York State and New Jersey Interstate Bridge and Tunnel Commissions, New Jersey Board of Commerce and Navigation, New York Transit Commission, North Jersey Transit Commission, Board of Transportation (New York City), Long Island State Park Commission, Westchester County Park Commission, Palisades Interstate Park Commission, Essex County Park Commission, Union County Park Commission, and the New Jersey League of Municipalities.

A number of national and local organizations, including the railroad, telephone and general public utility corporations, and such societies as the Playground and Recreation Association of America, the American Scenic and Historic Preservation Society and all Chambers of Commerce in the Region, have also rendered valuable aid whenever approached.

APPOINTMENT OF CITY COMMITTEE ON PLAN AND SURVEY OF NEW YORK

In June, 1926, Mayor Walker appointed a City Committee on Plan and Survey consisting of over 500 members, with Justice Morgan J. O'Brien as Chairman, for the purpose of making a comprehensive study and preparing plans for the future development of the city. At the request of the Mayor the staff of the Regional Plan co-operated with the City Committee in carrying on its studies and in preparing its reports.

Assistance Obtained from Departments of the Federal Government

The Committee is indebted in a special degree to the United States Geological Survey of the Department of Interior and to its Director, Dr. George Otis Smith, and his staff for the valuable service they rendered to the Regional Plan in producing an excellent reproduction of the 1 to 62,500 scale U. S. Geological Survey Topographic map on an enlarged scale of 2,000 feet to 1 inch for the greater part of the Region. The Chief of the Air Service, through the War Department, has also furnished valuable maps of parts of the area.

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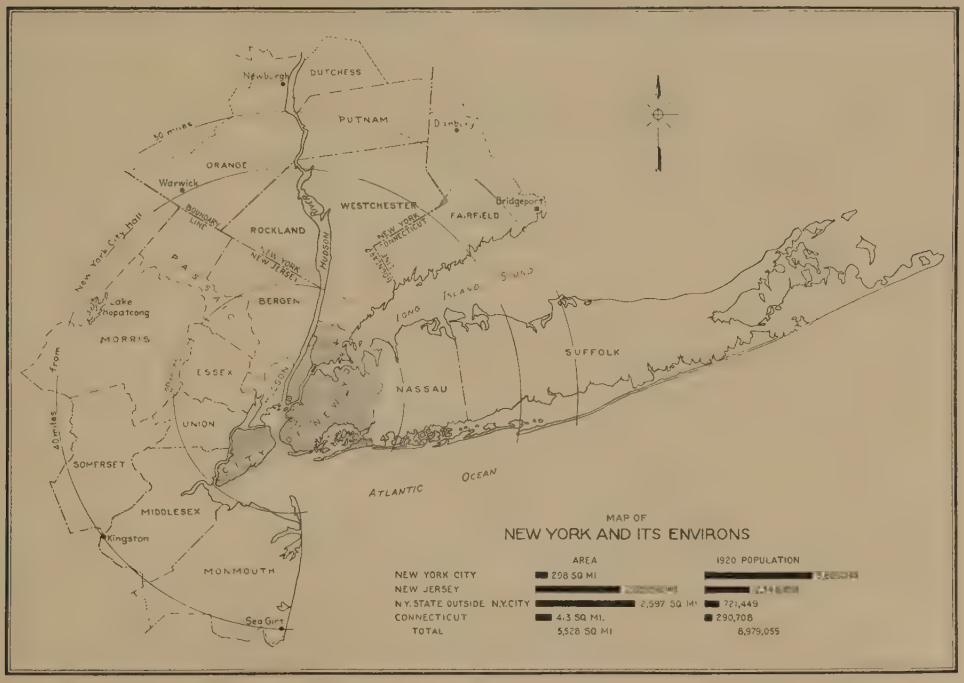


FROM AN OLD DUTCH PRINT—AMSTERDAM, 1792

INDEX MAP

OF

GRAPHIC REGIONAL PLAN

Red Figures indicate Numbers of Sections of the Atlas

Names and Boundaries of U.S. Geological Survey Quadrangles are in Blue

General Maps of the entire Region, including a Community Index Map, will be found in Pocket at the end of the Volume

SCALE IN MILES

0 5 10

LEGEND

The following maps present, in atlas form, the Regional Plan proposals and show their relation to existing facilities within the New York region. Taken as a whole, the maps illustrate a regional system of communication facilities and land uses. The importance of any specific project as part of the General Plan is indicated on small-scale maps of the entire Region in a folder at the back of this volume. The plan is not to be taken as indicating the precise position, alignment or boundary of the various proposals.

In both the traffic and transportation systems full lines are used wherever routes follow existing rights-of-way regardless of the need for paving or widening. The relative importance of highways, as indicated by the widths of the lines by which they are shown, is based on their importance in the regional scheme under future expected conditions. Express highways are considered as those which would be free from grade intersections with all important intersecting highways and thus permit an uninterrupted movement of vehicles along the express routes.

The land uses indicated are the predominant types of use to which land is likely to be put. Small isolated areas in which these uses may be at variance with the predominant uses are not indicated. It is intended that those areas designated for "other open development" should be reserved for country estates, agriculture, forestry or other types of use which would keep them relatively free from buildings.

A descriptive summary of the principal proposals shown on the atlas sheets and a further explanation of their classification will be found at the end of the atlas. The base map was prepared by the United States Geological Survey from standard topographic maps, as revised from information furnished by the staff of the Regional Plan Committee.

COMMUNICATION FACILITIES

TRAFFIC

GENERAL HIGHWAYS — EXISTING RIGHT-OF-WAY; NEW RIGHT-OF-WAY; EXISTING FERRIES

BOULEVARDS* — EXISTING; PROPOSED

PARKWAYS* — EXISTING; PROPOSED

EXPRESS ROUTES**

OTHER MAJOR REGIONAL ROUTES**

MINOR REGIONAL ROUTES

IMPORTANT CONNECTING ROUTES

* *Where red center line continues between green dashes it is proposed to construct a Boulevard or a Parkway along or on an existing right-of-way.*

** *The Metropolitan Loop is rendered in a width slightly in excess of that of the other major routes. It is partly an Express Route, partly a Boulevard, with the remainder an ordinary General Highway.*

TRANSPORTATION

FOLLOWING EXISTING LINES — OVER NEW ROUTES

RAILROAD BELT LINES

BELT LINES WITH SUBURBAN RAPID TRANSIT

RAILROAD CONNECTIONS OR WATERFRONT LINES

CONNECTIONS OR WATERFRONT LINES WITH SUBURBAN RAPID TRANSIT

SUBURBAN RAPID TRANSIT

PROPOSED SHIP CANALS

PROPOSED UNION PASSENGER TERMINALS

LAND USES

CLOSE DEVELOPMENT

EXISTING — PROPOSED

LARGER BUSINESS CENTERS IN COMMUNITIES OF OVER 25,000

PRINCIPAL INDUSTRIAL AREAS

RESIDENTIAL AREAS

BUSINESS CENTERS IN COMMUNITIES OF 3,000 TO 25,000

OPEN DEVELOPMENT

PUBLIC PARKS AND RESERVATIONS

PARKS OVER 10 ACRES

PARKS LESS THAN 10 ACRES

MUNICIPAL WATER SUPPLY PROPERTIES

PROPOSED PARKS AND RESERVATIONS

SEMI-PUBLIC OPEN SPACES

GOLF AND COUNTRY CLUBS

LARGER INSTITUTIONS

CEMETERIES OVER 10 ACRES

CEMETERIES UNDER 10 ACRES

MILITARY RESERVATIONS

AIRPLANE FIELDS EXISTING

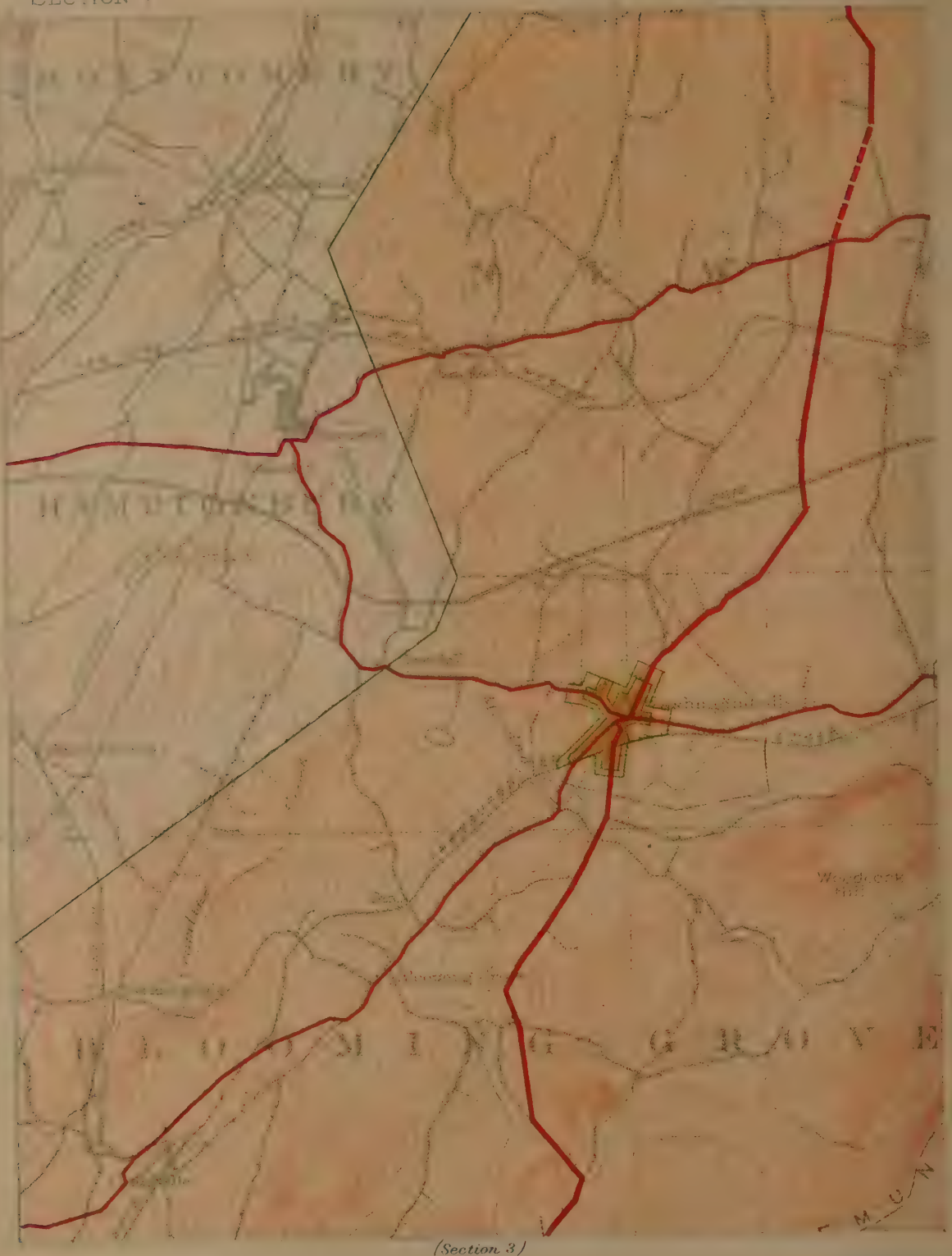
AIRPLANE FIELDS PROPOSED

SEAPLANE LANDINGS

PROPOSED WATER AREAS

OTHER OPEN DEVELOPMENT

NOTE: For convenience in reading the map sections, the above Legend is repeated on the flap on page 121 By opening this it will be available for reference while examining any one of the 96 sections of the atlas.



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Scale in miles

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Scale in miles

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S.W GREENWOOD LAKE

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Scale in miles

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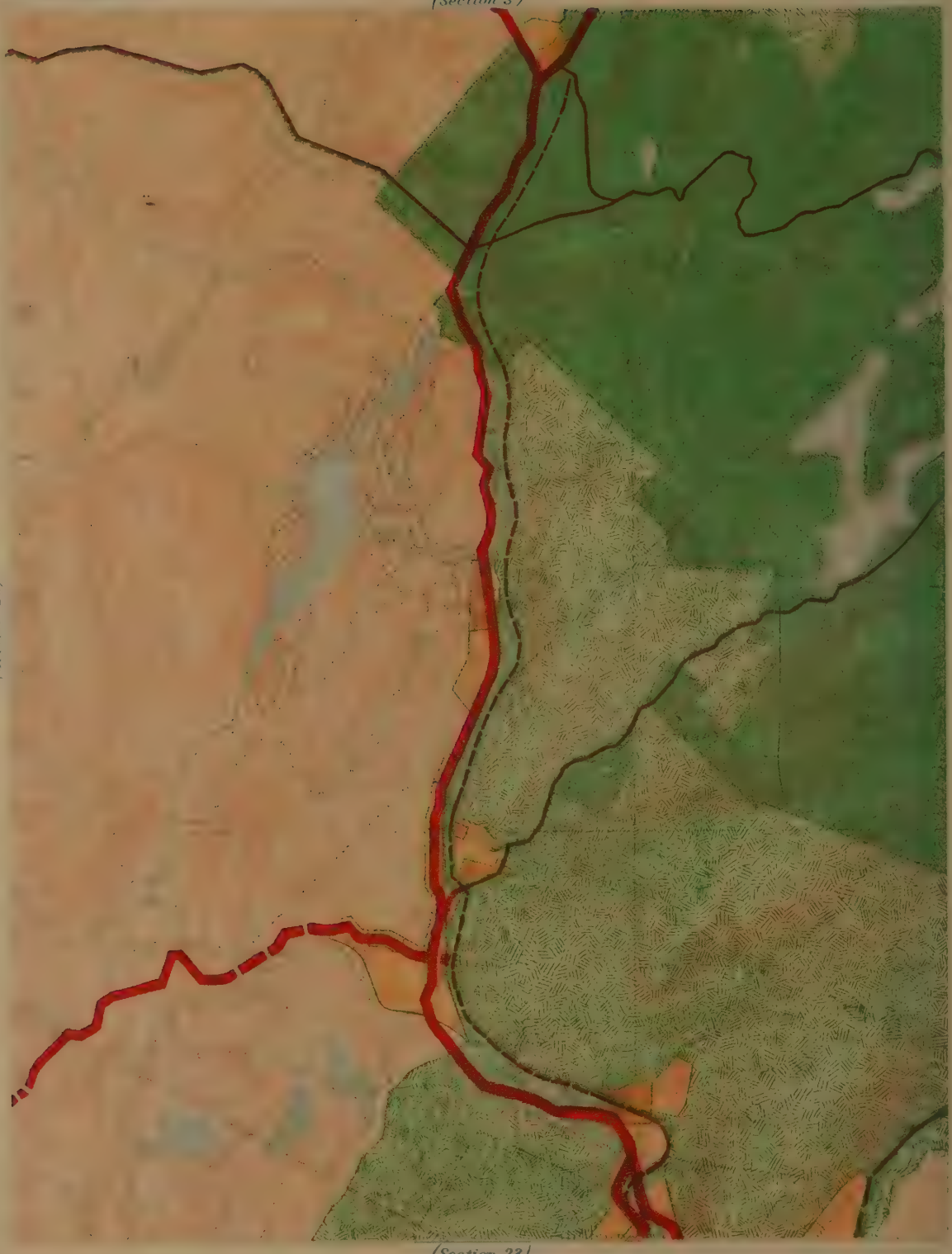

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Scale in miles

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NW TARRYTOWN

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Scale in miles

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Scale in miles

QUADRANGLE S E

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SECTION 3.

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Scale in miles

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S.W. NORWALK

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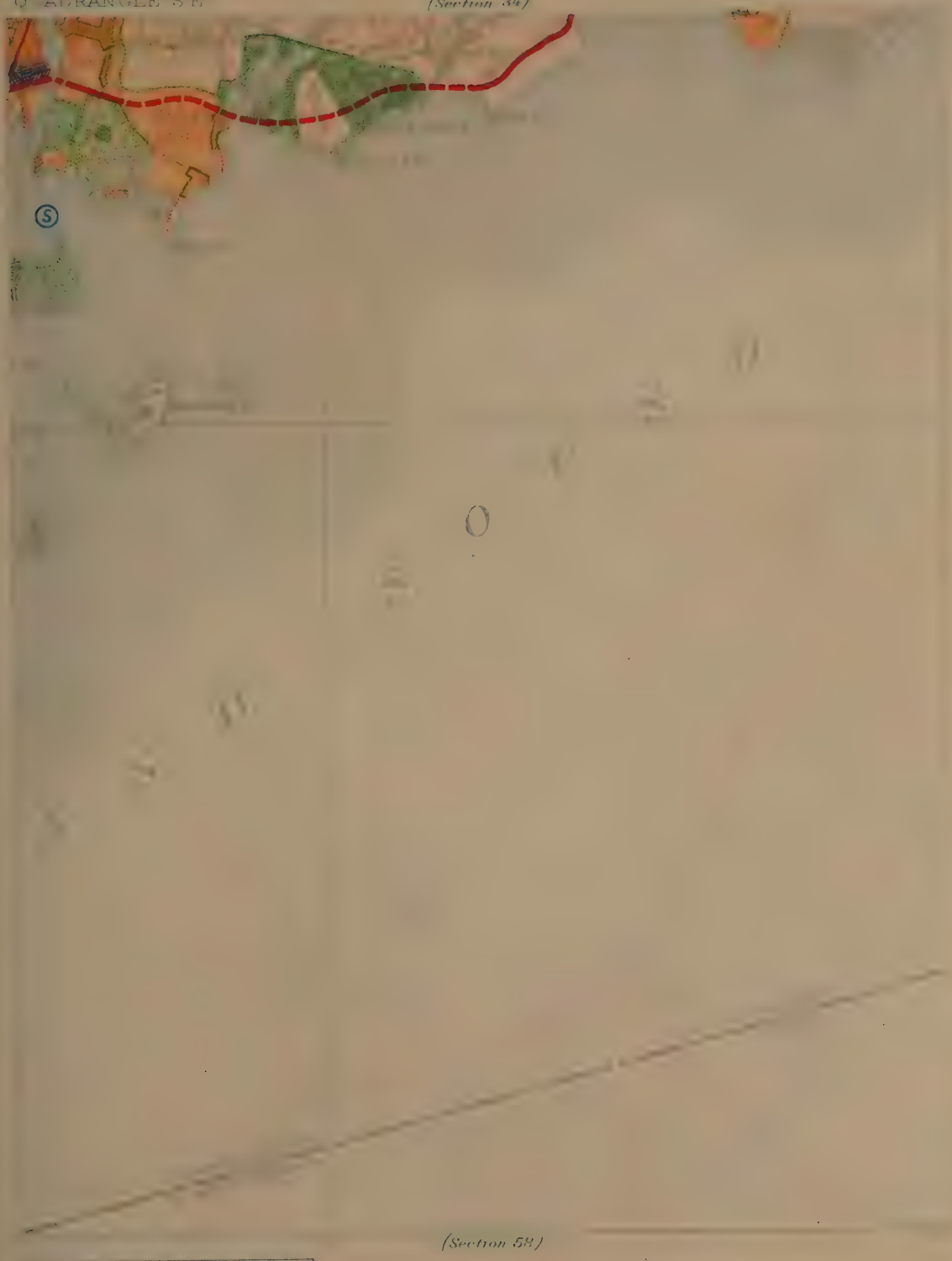
(Section 57)



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Scale in miles

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Scale in miles

QUADRANGLE S.E

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Scale in miles

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S.W MORRISTOWN

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Scale in miles

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Scale in miles

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Scale in miles

(Section 51)
(Section 70)

(Section 27)

NW HARLEM

(Section 46)

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Scale in miles

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Scale in miles

SECTION 53
(Section 31)
N.W OYSTER BAY
(Section 50)
(Section 55)
EXECUTION
Scale in miles

QUADRANGLE NE

(Section 32)

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Scale in miles

QUADRANGLE S.E.

(Section 54)

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Scale in miles

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Scale in miles

(Section 40)

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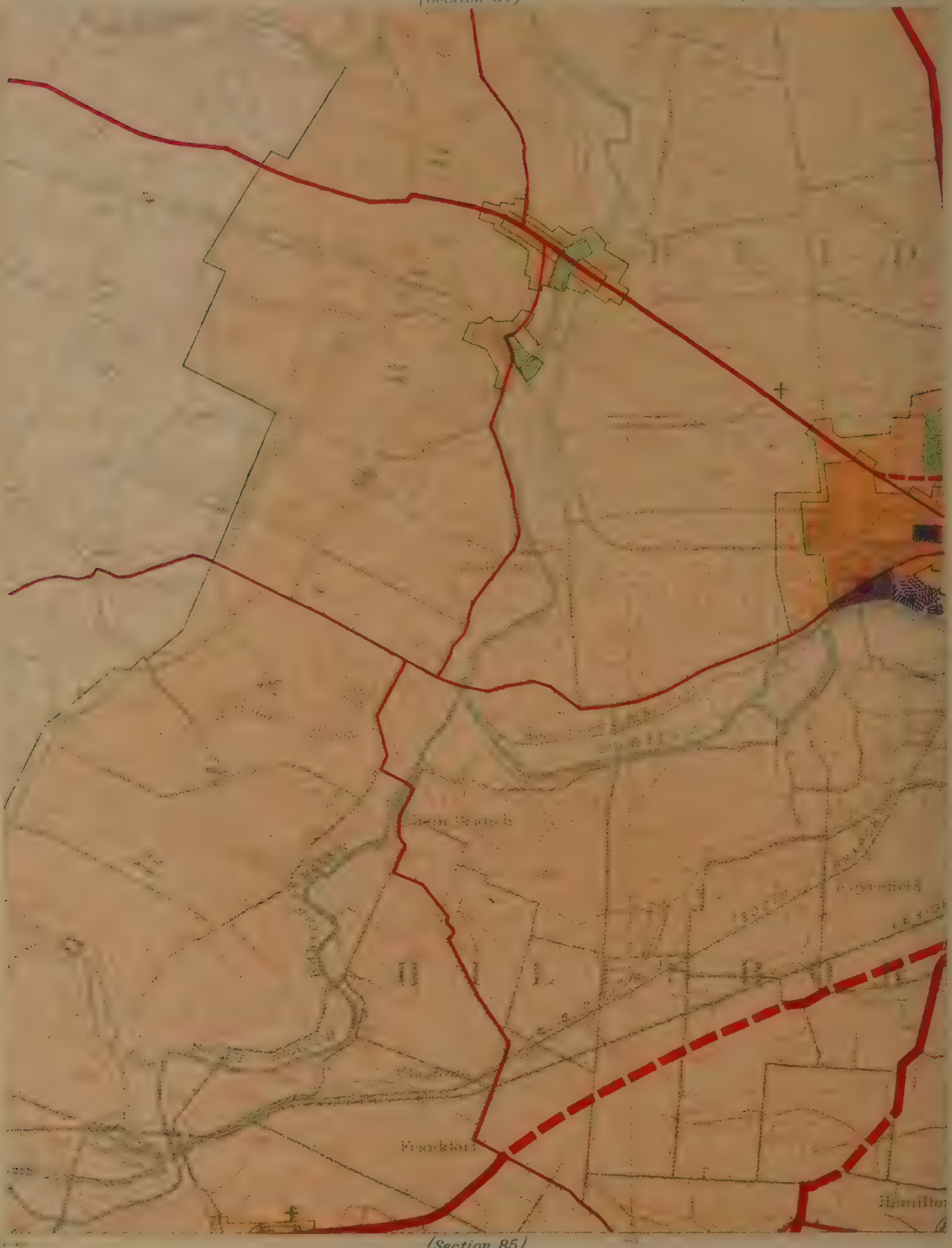

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Scale in miles

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Scale in miles

QUADRANGLE NE

(Section 44)

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(Section 64)

(Section 89)

Scale in miles

(Section 71)

(Section 90)

(Section 47)

NW STATEN ISLAND

(Section 66)

(Section 71)

Scale in miles

QUADRANGLE NE

(Section 73)

(Section 72)

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(Section 93)

Scale in miles

(Section 70)

(Section 75)

(Sections 93,94)

0 05 1 2

(Section 70)

(Section 75)

Scale in miles

QUADRANGLE N.E

(Section 52)

(Section 77)

(Section 76)

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(Section 73)

(Section 72)

(Section 94)

Scale in miles

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Scale in miles

(Section 81)

(Section 30)

0 05 1 2

SECTION 79

(Section 77)

S.W HEMPSTEAD

(Section 76)

Scale in miles

C E A

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(Section 59)

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(Section 83)

Scale in miles

(Section 60)

(Section 84)

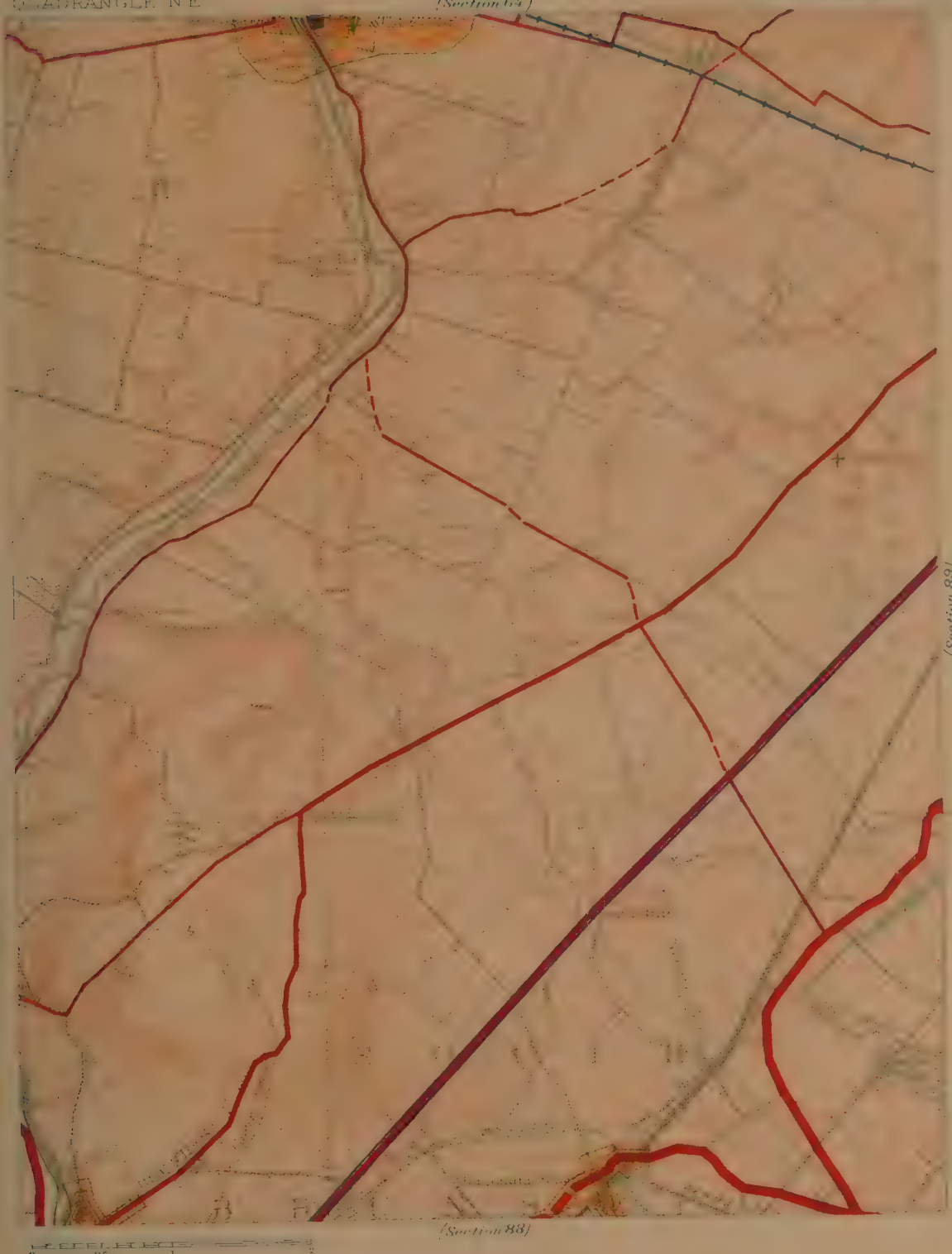
0 05 1 2

SECTION 83
(Section 81)
S.W. BABYLON
(Section 80)
Scale in miles

(Section 63)

(Section 87)

Scale in miles



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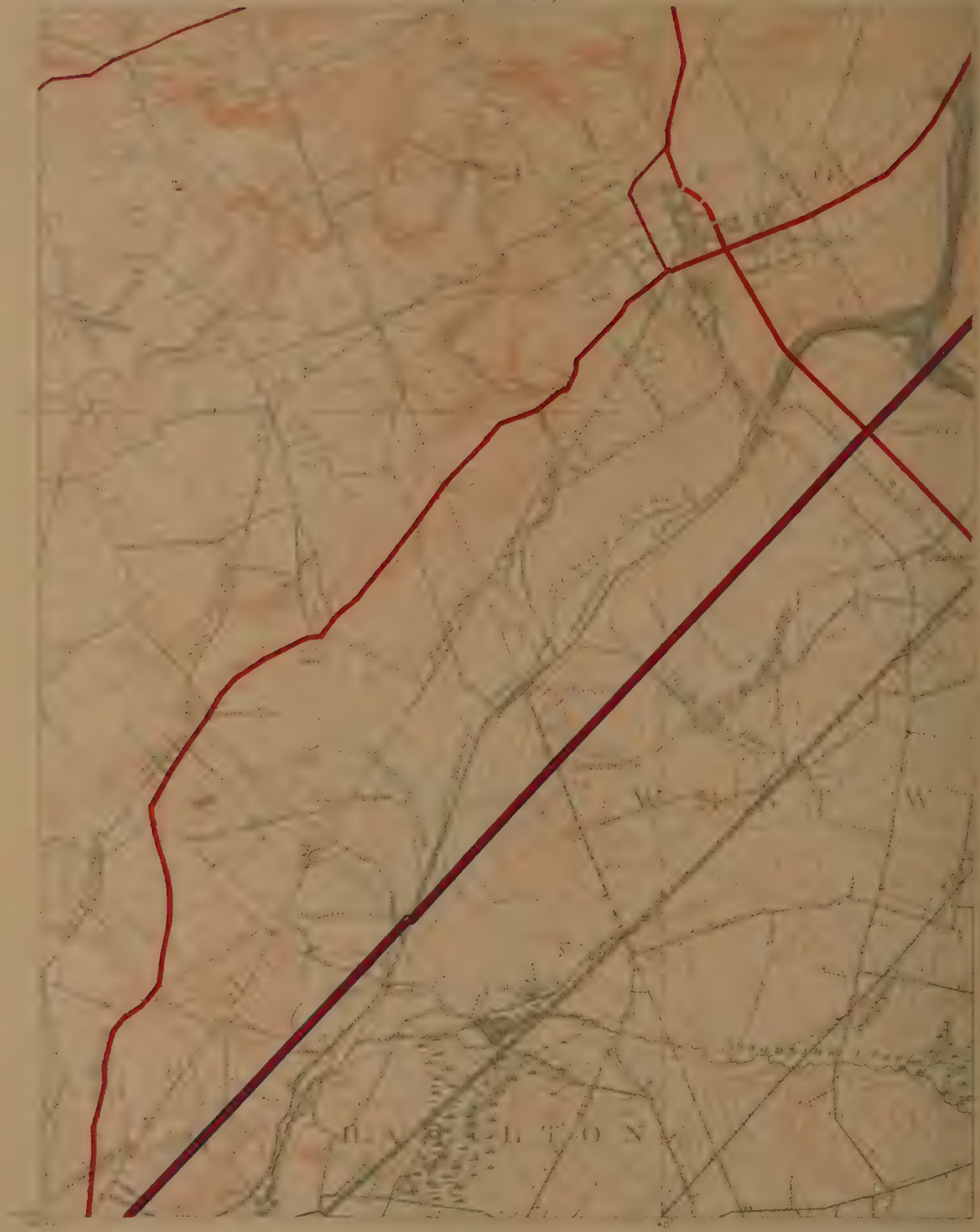
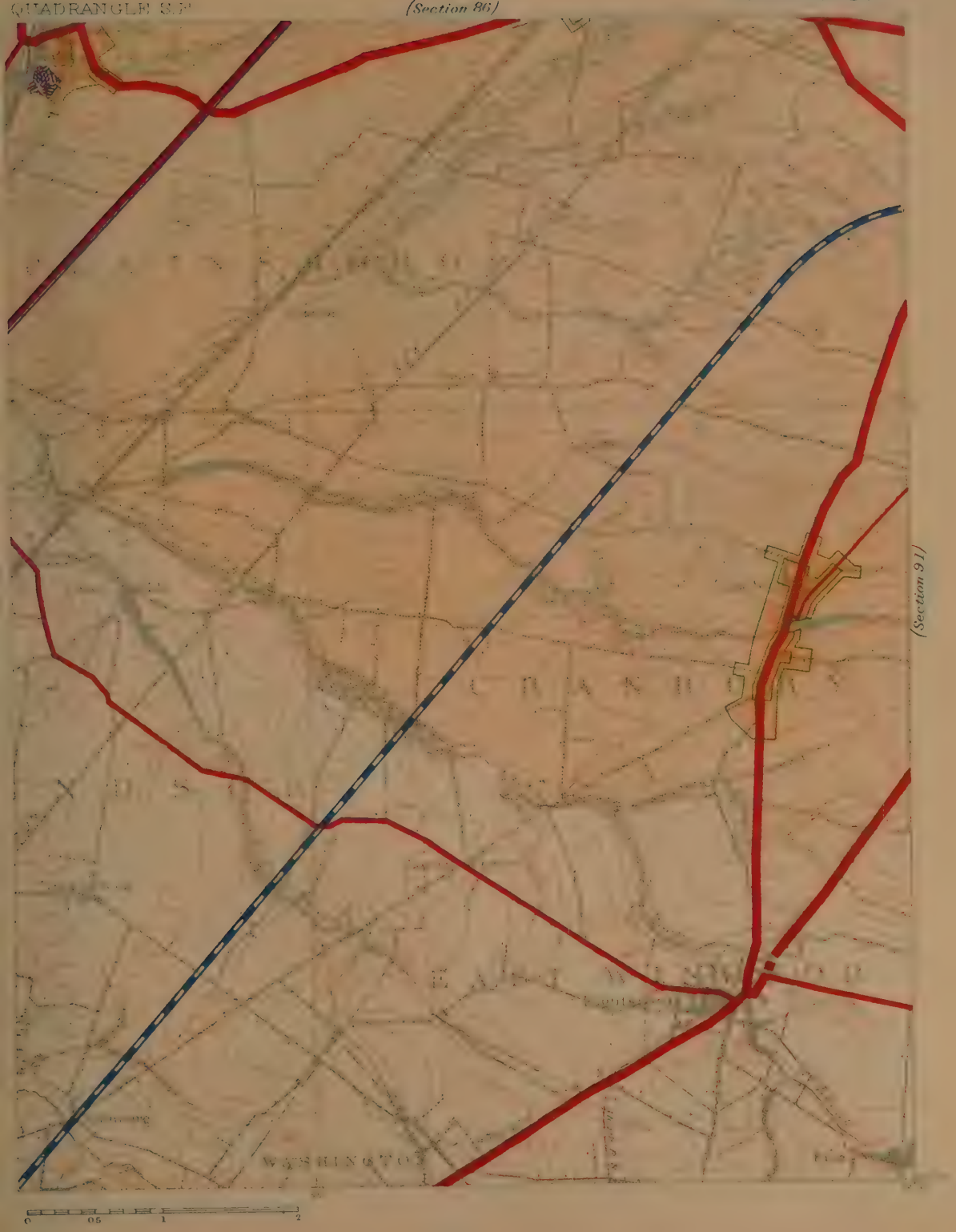

Scale in miles


QUADRANGLE S.E.
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(Section 91)
WASHINGTON
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Scale in miles

QUADRANGLE N.E

(Section 68)

SECTION 30

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Scale in miles

QUADRANGLE S E
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Scale in m

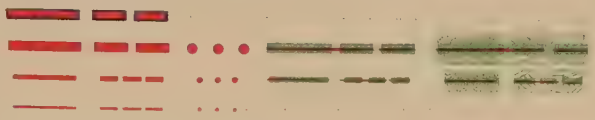
LEGEND

COMMUNICATION FACILITIES

TRAFFIC

GENERAL HIGHWAYS — BOULEVARDS* — PARKWAYS*

EXISTING RIGHT-OF-WAY | NEW RIGHT-OF-WAY | EXISTING FERRIES | EXISTING | PROPOSED | EXISTING | PROPOSED



EXPRESS ROUTES**

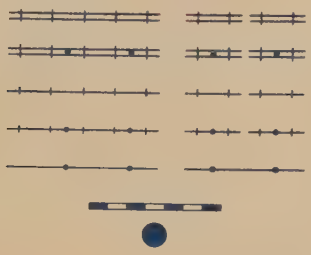
OTHER MAJOR REGIONAL ROUTES**

MINOR REGIONAL ROUTES

IMPORTANT CONNECTING ROUTES

TRANSPORTATION

FOLLOWING EXISTING LINES | OVER NEW ROUTES



RAILROAD BELT LINES

BELT LINES WITH SUBURBAN RAPID TRANSIT

RAILROAD CONNECTIONS OR WATERFRONT LINES

CONNECTIONS OR WATERFRONT LINES WITH SUBURBAN RAPID TRANSIT

SUBURBAN RAPID TRANSIT

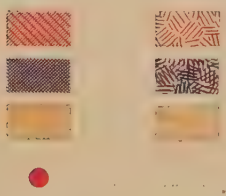
PROPOSED SHIP CANALS

PROPOSED UNION PASSENGER TERMINALS

LAND USES

CLOSE DEVELOPMENT

EXISTING | PROPOSED



LARGER BUSINESS CENTERS IN COMMUNITIES OF OVER 25,000

PRINCIPAL INDUSTRIAL AREAS

RESIDENTIAL AREAS

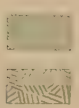
BUSINESS CENTERS IN COMMUNITIES OF 3,000 TO 25,000

OPEN DEVELOPMENT

PUBLIC PARKS AND RESERVATIONS

PARKS OVER 10 ACRES

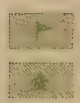
PARKS UNDER 10 ACRES



MUNICIPAL WATER SUPPLY PROPERTIES

PROPOSED PARKS AND RESERVATIONS

SEMI-PUBLIC OPEN SPACES

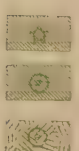


GOLF AND COUNTRY CLUBS

LARGER INSTITUTIONS

CEMETERIES OVER 10 ACRES

CEMETERIES UNDER 10 ACRES



MILITARY RESERVATIONS

EXISTING AIRPLANE FIELDS

PROPOSED AIRPLANE FIELDS

SEAPLANE LANDINGS

PROPOSED WATER AREAS

OTHER OPEN DEVELOPMENT

* *Where red center line continues between green dashes it is proposed to construct a Boulevard or a Parkway, along or on an existing right-of-way.*

** *The Metropolitan Loop is rendered in a width slightly in excess of that of the other major routes. It is partly an Express Route, partly a Boulevard, with the remainder an ordinary General Highway.*

PROPOSALS ON THE – GRAPHIC REGIONAL PLAN

Photo by Fairchild Aerial Surveys, Inc.

THE CENTER OF WASHINGTON

"After a hundred and fifty years the Plan of Washington has shamed every unplanned city in regard to its ability to meet conditions of change."—Page 128.

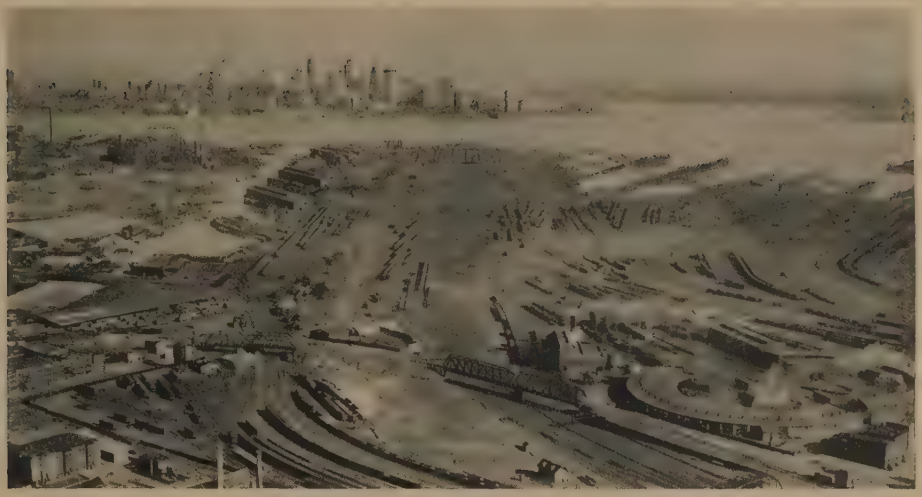


Photo by Fairchild Aerial Surveys, Inc.

THE HARBOR OF NEW YORK FROM NEW JERSEY

"The Plan deals with the two sub-regions as a unit centered around the Port of New York."—Page 126.

I. PROBLEMS AND PROPOSALS IN PERSPECTIVE

Introductory

THOSE who have been responsible for making the Plan of the New York-New Jersey-Connecticut region described in the following pages have had to approach the study of the separate problems of the Region from a point of view sufficiently aloof and detached to permit of a just measure of their proportions and relations. In making a study of a community so vast in scale and complex in detail, and in trying to formulate tentative proposals for the guidance of its growth and development, they have had to face a number of questions which present themselves only when one thinks of the totality rather than the parts. They have had to recognize that the great whole is a living thing, with a certain spirit of its own, a sort of anatomy, and something like a functional physiology. What forces have molded all these? Can it be seen what determines the relations of parts to one another and of parts to the whole? By putting and endeavoring to answer such questions, the staff of the Plan has sought to arrive at a clearer notion of what is significant and permanent, and what is probably only unimportant or ephemeral. In general perspective and in relation to essentials, it has been seeking to discover by means of the regional survey what the New York region is and what tendencies are revealed by the character and forms of its urban growth. In the two volumes, of which this is the first, the Regional Plan and ancillary projects are described and illustrated. Together, they present a conception of what New York may become.

The Graphic Regional Plan, presented in atlas form in this volume, shows what facilities for circulation are needed, or are likely to be provided, and what may be anticipated in regard to the character and distribution of land uses in different areas, in the future. The discussion of principles affecting building development and concrete planning projects, including those that relate to the architecture of the city, are reserved for presentation in the second volume. Thus the Regional Plan comprises two distinct parts or pictures—one dealing in the main with horizontal features and the other, in the main, with vertical features of city growth.

In putting forward these two pictures it is realized that they anticipate only one set of possibilities out of many that may occur under influences that cannot now be foreseen. The authors of the Plan have no illusion that their conception is a final conception, even if it may be assumed to be based on an accurate diagnosis; for planning must be continuous and every plan is merely a step in what must be an evolutionary process. The Plan is a beginning in this process. Whether its purpose is well-conceived in the light of what is best for human well-being, and whether it influences public opinion and impulses in the right directions, are believed, at this stage, to be more important than whether the proposals it contains are actually realized. In other words, the success of an initial and outline plan is not so much to be appraised by the extent of the things realized as by the quality of the things sought to be realized, subject to their practicability.

Before describing the Graphic Regional Plan, which is shown on the accompanying Atlas, it is desirable to recapitulate in brief summary a few outstanding facts regarding the Region, to recall what is the object and scope of the Plan, to refer to certain relations that exist between its problems of circulation and land uses, to indicate the methods of carrying out the proposals it contains and to point out its national importance.

Some Outstanding Features of the Region

The following characteristics of the Region are among those which have been presented in the volumes of the regional survey:

Main Geographical Divisions.—The Region which is dealt with in the Plan has been defined as "New York and its environs." It is in effect a twin region or two intimately related sub-regions—one lying east and another west of the Hudson River. The first comprises an area of 2,232 square miles in the State of New York and an outlying area of 413 square miles in the State of Connecticut; the other comprises a total of 2,883 square miles, mostly in the State of New Jersey, but including Staten Island (57 square miles) and an outlying area of 598 square miles in the State of New York.

Unity of the Region.—The first of the geographical subdivisions is dominated by New York City, and the second by the group of cities which include Newark and Jersey City on the west of the Hudson River. Any plan for these two sub-regions combined is as much a New Jersey as it is a New York plan. The Plan deals with the two sub-regions as a unit centered around the Port of New York.

Size.—The total area of 5,528 square miles is five times the size of the State of Rhode Island and one-tenth the size of England. The whole Region is shown on the Pocket Maps at the back of this volume. The more limited area shown on the Atlas comprises approximately 4,263 square miles, and constitutes what may be defined as the greater metropolitan area.

Political Diversity.—It is subject to the divergent laws and political conditions of three states, and in 1925 there were 436 authorities exercising local government within its boundaries.

Population Density.—Within the whole area there are approximately 10,000,000 people, of whom about 6,000,000 live within the City of New York, having an area of 298 square miles. The population per square mile in 1920 varied from 103,823 in Manhattan to 45 in Putnam County.[1] The day population of Manhattan below 59th Street on a typical business day in 1924 was approximately 3,000,000; the population entering this same area from outside was computed at 1,959,700 per day.[2]

Annual Budget.—In 1926 the taxes levied in the Region aggregated $584,495,000.[1] In 1928 the budget of the City of New York alone involved an expenditure of $538,000,000.

Property Values.—The total value of taxable land in the Region in 1923 was about $9,160,427,000, of which over a half was concentrated in Manhattan. Average values ranged from $460,000 per acre in Manhattan to $57 in Putnam County. In 1926 the total value of taxable property in the Region was $23,053,154,000, or $2,280 per capita.[1]

Population Distribution.—From 1920 to 1925 the increase of population in New York City was only 4.5 per cent as against 23.6 per cent in Westchester and 64.6 per cent in Nassau County. In 1905 over half the population of New York City resided within four miles of the City Hall; by 1925 the percentage was reduced to 30; and during the same period the percentage living in the area from eight to 12 miles distant from the City Hall, increased from 8.55 to 22.13.

Street Traffic.—In 1926 there were, in New York City alone, 421,000 passenger automobiles, 107,000 trucks and 34,000 motor buses and taxicabs. The number of motor vehicles in the whole Region in the same year was 1,330,000, giving a ratio of 7.6 between population and vehicles as compared with 35 in 1916. The one-way vehicular traffic entering Manhattan below 59th Street during 24 hours on a typical business day in 1924 was estimated at 204,750 vehicles.[2] In New York City alone there were in use in 1929 about 4,300 miles of street, of which 2,359 were paved.

Rail Facilities.—In the Region there are 12 trunk railroads with terminal facilities and 1,890 miles of right-of-way. In 1924 the number of passengers carried on the railroads to and from New York metropolitan terminals was about 243,074,000, of which about 162,000,000, or two-thirds, were commuters. In 1925 New York City had 595 miles of rapid transit tracks. In the year ending June 30, 1928, rapid transit lines in New York City carried about 1,908,500,000 passengers. The number of passengers carried by surface car lines in the Region has remained practically stationary since 1914, while those carried by the buses of the Fifth Avenue Coach Company in 1923 had increased five times since 1914. The total inbound freight (excluding interchange) increased from about 40,000,000 tons in 1899 to 56,000,000 in 1923, with corresponding outbound figures of 8,500,000 tons and 12,500,000 tons.[3]

Waterfront and Its Port.—In the whole Region, including Long Island, there are 1,800 miles of waterfront, of which 125 miles are commercially developed. The facilities of the Port of New York included 868 piers. Uniting its railroad terminals with different parts of the waterfront there are 93 carfloat bridges. Its navigable waterways are crossed by 121 bridges. It has 626 bulkheads and 184 shore wharves. It has also been developed as a shipbuilding center and has 57 shipbuilding, drydock and repair plants. The aggregate storage of its grain elevators is 8,000,000 bushels and there are also 13 floating elevators which load grain from barges into vessels. Along the waterfront there

[1] Regional Survey, Volume II. [2] Regional Survey, Volume III. [3] Regional Survey, Volume IV.

are 222 warehouses which perform more or less necessary functions in handling the traffic that moves through the Port.[1] In 1922 New York had a foreign trade valued at $3,456,761,371.

Industries. —The number of manufacturing plants in the Region was 19,416 in 1900 and is now over 60,000. The number of employes in the inspected factories has increased from 656,987 in 1900 to 1,206,123 in 1922. There are indications that this rate of industrial growth is still proceeding in the same ratio.[2]

Schools and Theaters.—In the City of New York alone there are 676 day schools and numerous other educational and cultural institutions. It has about 500 theaters, in addition to about 300 houses in which moving pictures make up the entire program.

Open Spaces.—The total area of public parks, cemeteries, municipal watersheds and the like in 1927 was 159,097 acres, of which 14,993 acres were within New York City. There was one acre of parks to every 601 persons within the city, and one acre to every 1,245 persons in Manhattan. Within approximately 200 miles of the city there were in 1924 about 656,000 acres of forest reserves and public reservations of 1,000 acres or more in size.[3]

From the preceding summary we gather an impression of the New York of today. What of the future? Perhaps some may echo Tesman in *Hedda Gabler* and say "Good heavens, we know nothing of the future," to which Lövborg's conservative reply may be given: "No—but there is a thing or two to be said about it all the same." But the city being of man's making we may go far in actually anticipating the future and in providing for it by a plan—no matter what changes may take place. After a hundred and fifty years the Plan of Washington has shamed every unplanned city in regard to its ability to meet conditions of change.

Preliminary Studies and Mapping of Region

Study of Sectors.—The preparation of the Graphic Plan has proceeded for a period of about six years, following the spring of 1923, during which the regional survey has been completed. For over a year previously, valuable preliminary studies were made by the late Nelson P. Lewis, formerly Chief Engineer of the Board of Estimate and Apportionment of New York City. Subsequently a pathfinding survey of the functions of the land and the existing means of communication was made during the early summer of 1923 and dealt with the area in six sectors.[4] Each of these sectors was assigned to a city planner and the work was carried out in collaboration with Mr. Lewis and in accordance with a program agreed upon by the group of investigators. The following is a list of the Advisory Planning Group and of the sectors which were assigned to them for study:

Sector 1. Nassau and Suffolk Counties and undeveloped portions of Queens.	Frederick Law Olmsted Associate—Henry V. Hubbard

[1] These figures are from The Port of New York, Part 2, War Department and United States Shipping Board, Government Printing Office, 1926.

[2] Regional Survey, Volume I. Regional Survey, Volume V.

[4] See reference to survey of sectors, Regional Survey, Volume VIII, page 192.

Sector 2.	Area north of the city and east of the Hudson River, including Westchester County and part of Putnam and Fairfield Counties.	Thomas Adams—Chairman of Group Technical Assistant—Hale J. Walker
Sector 3.	Area to west of the Hudson, comprising parts of Bergen, Rockland, and Orange Counties, and on the east of the Hudson comprising parts of Putnam and Dutchess Counties.	John Nolen Associate—Philip W. Foster
Sector 4.	Passaic County and parts of Orange, Rockland, Bergen, Morris, Essex and Hudson Counties in New Jersey.	Harland Bartholomew Associate—L. D. Tilton
Sector 5.	Union County and parts of Essex, Hudson, Middlesex, Somerset and Morris Counties.	George B. Ford Associate—Ernest P. Goodrich
Sector 6.	Richmond County and parts of Middlesex, Monmouth and Somerset Counties.	Edward H. Bennett Associate—H. T. Frost

Sector maps showing certain tentative proposals were prepared for each sector on the U. S. Geological Survey maps, which are on a scale of 1 to 62,500, or approximately an inch to the mile.

Basic Regional Map.—After the preliminary planning studies were completed it was found necessary to obtain a basic map of a larger scale on which the more extended and complete studies could be prepared. The procedure involved in preparing this map has already been referred to.[1] Its preparation entailed great labor and expense, particularly in connection with making the revisions desirable for the purpose of the Plan. In addition to being essential for the making of the Regional Plan the map has proved of great utility to public authorities, private corporations and individuals. One of the great needs in the Region is a more accurate and complete base map at a uniform scale and with a standard system of presenting the data shown thereon. Good local maps were available for many different parts of the Region but at a variety of different scales and comparatively few were complete. The government maps proved the best available starting point for a general base map.

Aerial maps and oblique views from the air have greatly facilitated the studies of existing conditions, with great savings in time and labor. Also, the combination of the topographic map and aerial maps has enabled the staff to prepare the Plan with a degree of accuracy which would have been impossible a few years ago. But in spite of the comparative accuracy of the map for purposes of showing a general outline plan, more detailed and accurate maps are needed for purposes of city planning.

The Graphic Plan was drawn upon the large scale maps and, thereafter, by an elaborate process, the whole Plan was reduced for the purpose of publication to the original scale of approximately one inch to the mile.

[1] See Regional Survey: Preface to Volume I and Chapter XVI of Volume VIII.

TYPICAL SECTION OF BASIC REGIONAL MAP—SCALE, 2,000 FEET TO ONE INCH

Showing the Communipaw area and harbor entrance of the Hudson River opposite Manhattan. The basic map was considerably revised before its reproduction as the base map of the Atlas.

Object and Scope of Plan

General Object

The object of making the Plan is to give guidance to the people of the Region and the governing authorities that represent and act for them, to enable them to so direct urban growth in the future that the greatest practicable measure of health, safety, convenience and general welfare will be secured for the inhabitants. This object includes the obtaining of an adequate and well co-ordinated system of ways of communication, a well balanced distribution of land uses and such degrees of order and beauty in the art of building, as well as in the preservation of a spacious natural environment, as will conduce to wholesome living and working conditions.

It may be frankly stated that the only real hope of achieving this object lies in the application of preventive measures, particularly in those areas where new developments or extensive reconstruction are likely to take place. Half-hearted schemes designed to ameliorate existing conditions may arrest the growth of evils but cannot cure them. At the same time no plan can be complete which does not contain practical proposals for dealing with the problems of areas that are already built upon. The planning of areas that are still unbuilt upon or are developed with temporary structures, although presenting the greater opportunities for securing improvements, cannot be sufficient to meet the needs of an increasing population because the major part of their economic activities will continue to center in the heart of the Region with its built-up conditions. Moreover built-up areas as well as open areas are undergoing constant change of use, and reconstruction in the former proceeds almost as rapidly as new construction in the latter. Even if a perfect development of all vacant land could be achieved in a city, as the result of a plan, it would provide only a partial improvement of its living and working conditions so long as the principal business centers and central residence sections were allowed to expand their building bulks without a guiding plan.

Nevertheless it remains true that the full benefits of planning can be obtained only in those areas where it is possible to prevent the beginning of bad conditions. This is true not only because it is easier to prevent than to cure, but also because it is easier to impose restraints in advance against something being done that will be injurious to the community than it is to get rid of the injury after it is done. Misplanning of vacant land is a primary cause of the evils of congestion and indiscriminate building which make later planning and zoning ineffective.

The following premises have been accepted *inter alia* as forming a sound basis for guidance in developing the Plan:

1. *Growth of Population.*—It is essential for public well-being that the per capita standards of health, comfort and safety of the population be raised above present levels to the full extent that harmonizes with true economy, in proportion as the population increases.

2. *Street Circulation.*—It is essential for convenience and efficiency in transaction of business that movement should be fast, have the least possible degree of interruption, and have ample space for parking.

3. *Uses of Land.*—It is essential for the places of work and the places of residence to be conveniently related to one another so as to lessen unnecessary travel and yet to be separated enough so as to secure concentration of industry and business on the one hand, and pleasant and restful surroundings for dwellings on the other hand.

4. *Bulk of Buildings.*—It is essential for the prosperity of the community that concentration of buildings and economic activities should not be greater than clearly desirable for efficiency of industry, commerce and business, which efficiency can only be secured in proportion as open space is maintained for health, within and surrounding buildings, and for movement of traffic to and from buildings.

Those who accept these as reasonable premises will not be misled into assuming, as is too frequently done, that increase in population and bulk of building are in themselves productive of wealth, or that increase of land prices based on crowded and unhealthy uses of land is an indication of prosperity.

One of the chief problems in planning is to maintain a proper balance in adjusting the above four things to one another. In the central districts of New York a vicious circle has been created in connection with growth of population, street circulation, land uses, and building bulks because of failure to recognize their interrelations. Thus growth in bulk of buildings, paralleled with indiscriminate mixing of uses adds to transit and traffic congestion; while increase of transit facilities and widening of streets give new scope for increasing bulk of buildings, for increasing the variety of uses, and for widening the distances between places of work and residence.

In considering what proposals to include in the Plan for securing the object of a better balanced system of growth, the staff has had to have regard to existing methods of growth, habits and wants. These it could not ignore. Nor could it assume that there would be any revolutionary change on the part of the public in favor of a more ideal system of city development. And yet the staff has acted on the principle of looking at the problems of the city on the basis of what should be, qualified by what is and can be, rather than on that of projecting present conditions and methods into the future merely because they have the wide assent of public opinion.

Comprehensiveness in Area and Functions

An examination of the field of inquiry covered by the regional survey, clearly shows that the Regional Plan to fulfill its object must be comprehensive in regard to the functions and circulation of the area dealt with as well as in regard to its geographical extent. The failure of plans to achieve adequate results in the past has

been due largely to lack of comprehensive treatment of the combined problems of circulation, utilization of land and building development, for an area large enough to enable problems of urban growth to be understood in proper perspective and in their full significance and relations. While, however, an effort has been made in preparing this Plan and in carrying out the survey on which it is based, to deal with all essential features, it has been found necessary to avoid widening of its scope to matters which are not pertinent to the main purposes in view, or to extend the area beyond that which can be dealt with effectively as a physical unit.

Area.—On the whole it has been found that the area originally selected was the proper one to choose although based on nothing more than general knowledge and observation of the physical characteristics, and the social and economic conditions of the metropolitan area.

The boundaries were determined largely on four grounds, namely: (1) they embraced the area within which the population can and does travel in reasonable time from home to place of work—that is, the commuting area; (2) they included the large outlying recreational areas within easy reach of the metropolitan center; (3) they followed the boundaries of cities and counties at the periphery of these areas, so as to relate the plans to the areas of administration; and (4) they had regard to the physical characteristics, such as watersheds and waterways. On the latter ground, the whole of Long Island was included, notwithstanding that a great part of it is outside the commuting area. While the Region has been proved to be a satisfactory area for effective planning, New York has economic interests far beyond its boundaries. It has common problems with communities hundreds of miles distant, and part of its water supply is derived from areas that lie many miles away from its outer edges. These external interests have not been lost sight of in making the Plan.

Functions.—It is more difficult to define the limits of a plan from the point of view of the engineering, architectural, economic and social functions than from that of its geographical extent. The human mind inclines to go from one extreme to another. The belief that planning in the past has been carried out with too narrow a conception of what needs to be planned has driven many to the assumption that there can be no limit to the civic problems that should be dealt with in a plan. If, however, a plan were to deal with all physical, economic and social features of the city, it would be nothing less than a charter of civilization. It is obvious that by trying to do too much, we may accomplish as little as by failing to do enough. The same observations applied to the regional survey. Decisions as to what were the most relevant and essential features to be investigated have been an important part of the work of making the survey. The temptation to inquire too much is sometimes based on the temptation to include too much in a plan. Even when it is decided that there must be limits in the field to be dealt with in a plan, it is not easy to determine

what are the best limits. Moreover it is not easy to define the limits in terms, even when we have an understanding of what they should be.

It is obvious that a plan cannot be limited solely to physical improvement, or at least to the physical elements in the improvements to be proposed. Every civic improvement, as well as every failure to make an improvement, has its economic and social implications. In attempting to define what these implications are, it is admitted that the definition cannot be made quite clear in words.

Limitations of Planning

Referring to the report of the City Committee on Plan and Survey, of New York City, the *New York Evening Post*[1] said that the report recommended "for the City Planning Commission a field of action so broad, a burden of effort so heavy, as to down its activities from the start." It went on to claim that the sound conception of city planning was one which meant the promotion of "order and beauty" and the presentation of a ground diagram of the city showing its larger scheme of centers, its transportation, its public buildings, its traffic arteries, and kindred features, in their proper place in an ordered connected unit. That is indeed enough; and yet no matter how restricted we may wish to make the field of planning, we cannot ignore certain aspects of housing, zoning or sanitation, which contain elements that are fundamental in producing the orderly city. What we have to refrain from are those detailed aspects of housing or sanitation or social order that have no direct relation to the development of the land, the transportation system or the general scheme of city building. What we have to pursue as our primary task is the making of a comprehensive ground diagram. We must have in view "order and beauty" of public and private buildings, and of centers, but these are, in an important sense, by-products of what may be called orderly ground planning.

The method of the Regional Plan has been to divide all planning into logically related divisions so as to avoid the confusion of attempting too much in one operation. As a broad, elastic outline of proposals, it covers more area and deals with more problems in less detail than the more definite city or village plan. The preparation of such a plan needs to be followed by local planning in order to obtain effective results. Using the regional outline as a basis, the city or village will limit itself to those features which the law permits it to deal with, and will relate such features to those that are outside the scope of statutory planning, such as trunk line railroads, transit lines and purely regional projects.

It is not considered, however, to be part of either the Regional Plan or of proposed city and village plans to deal with such related problems as reorganization of government; detailed planning of buildings; planning of systems of water supply and sewerage; or regulation of traffic. Most of these problems, especially those of

[1] Editorial, *New York Evening Post*, June 6, 1928.

water supply and sewerage, have had to be studied[1] in their broad features as a basis for planning the distribution of land uses and for making recommendations with regard to methods of treatment. But no specific proposals will be put forward for developing particular systems.

In regard to housing, regional and city plans should include proposals regarding such questions as the space to be reserved about buildings for health and recreation, and the distribution or districting of residence areas, but not proposals regarding such details as window space or planning of rooms. Proposals regarding traffic should stop short of regulation, but their combined effect should be to provide a basis to enable regulation to be used to the minimum extent and with efficiency in operation.

Relation of Ways of Communication to Land Uses

Problems of Circulation

The proposals in the Graphic Plan that relate to circulation or ways of communication include suggestions for extending lines and improving terminals of railroads and transit systems, for enlarging the facilities of waterways and harbors, for constructing airports and landing fields, and for elaborating systems of highways, parkways and streets.

Improvement of Rail Transportation.—Expectations in more or less authoritative quarters regarding the future development of airplanes seem to have detracted public attention in recent years from the prospect of future changes in connection with rail and water transportation. Increased efficiency of locomotion of every kind may be expected in the next forty years. Ships as well as dirigibles will transport people across the Atlantic more rapidly than before. Improvement in terminals and electrification of trains will tend towards increased efficiency in railroad transportation. The comfort of the railroad will grow relatively in proportion as the discomfort of the highway is increased. It is hardly conceivable that the growth of transport by road will result in making it more restful travelling than an improved electrical service by rail will be. Force of competition will make the railroad companies realize the asset which they possess for travelling over anything but the shortest distances.

There is a prospect of developments in road transportation, as an auxiliary to that by railroad, that are still undreamed of. For example, it appears likely that the motor bus will add greatly to the areas within which people may live and yet have convenient access to railroad stations. As the bus services within the wedges that lie between railroad lines develop, commuters will not only live farther from stations but the environs of the stations themselves will increase in importance as subsidiary centers for shopping and amusement and will stimulate the dispersal of population from the central areas.

[1] See Regional Survey: Volume II, on Government; and Volume VIII, on Water Supply and Sewerage Problems.

It is important to make one reservation with regard to the combined proposals for railways and highways. While the railroad and highway systems outlined on the Plan are so designed that they will be complementary to one another, it is admitted that if a bold and comprehensive treatment of the highway system is pursued, in advance of actual need, instead of following far behind such need, a great deal of the expense in railroad and transit line construction may be avoided and the plan of those latter facilities may stop short of what is proposed. The plan of communications has been so prepared that this partial carrying out of the proposals may be done without seriously diminishing the benefits of carrying out the Plan as a whole. It is possible that railroads and rapid transit developments in future will

Photo by Edwin Levick

STREET CONGESTION AT INTERSECTIONS
Vehicular and pedestrian traffic at Fifth Avenue and 42d Street, Manhattan.

have to be adjusted to highway and airway developments, instead of the reverse. The railroads will have to be specialized to a greater degree than at present to deal with traffic that cannot be dealt with by air or highway. For certain specialized functions, including long distance travel and for heavy bulks, it will continue to dominate. For certain other functions it may be frankly accepted that air and highway carriers will be in competition with railroads.

Effect of New Tunnels and Bridges.—In the New York region new tunnels and bridges will effect changes in distribution that can hardly be visualized. Those shown on the Graphic Plan are conservative in number compared to what many seem to expect. Yet, if and when the Plan proposals are carried out, immense areas of land will be made accessible to the population for industries and homes, and will result in great diffusion of both. As the invention of the airplane has temporarily

diverted attention from the still unexploited opportunities of existing facilities, so the building of new bridges and tunnels has been accepted as an alternative instead of as an auxiliary to water transportation by ferry. There is still great scope, however, for improvement of ferries and for development of a co-ordinated system of motor highways connecting the most populous centers and waterfronts of the city.

The Motor Car.—The motor car is too recent as a form of transportation to enable any final judgment to be expressed as to its ultimate influence on future growth. Up to the present time it has helped to add to the congestion of the street while greatly aiding the movement of people and goods in the streets and highways; it has also increased the dangers of the highway and created new problems with regard to the provision of recreation spaces. It has already begun to separate the city into detached neighborhoods between the great radial arteries that spread out from the center of the city. It has also exerted a powerful influence in changing conditions but it is probably capable of reversing some of the changes it has already made in the growth of communities.

Air Transportation.—The airplane is in such an early stage of development that proposals as to what is needed in the future must differ greatly from what is needed in the present pioneer stage. The scope of air travel is such as to stir the imagination with its opportunities for rapid and almost unrestricted movement.

As cities like New York, London and Paris have grown up without any provision for air transportation, it follows that anything they can do to provide landing facilities must be hampered as the result of the high cost of providing these facilities near to existing centers. Moreover the uncertainty as to the extent and actual requirements of the airplane in the future does not encourage the expenditure of large sums of money that would be necessary to carry out a bold scheme in keeping with the possibilities of air travel.

The form of communication most likely to serve the needs of the airplane are the motor bus and the motor car. There is no reason why the landing field should not be at some distance from the center, if the highway forming the approach to it is sufficiently free of obstruction to permit speedy travel.

In estimating the cost of providing landing fields there should be included with the actual cost of the acquisition and development of the land the cost of a speedway connecting the airport with the city. The advantage of Governors Island, which is recommended in the Plan as a small landing field, will be in its accessibility to the center. The same advantage would exist in the case of utilizing the Brooklyn Navy Yard, if and when it is abandoned for naval purposes. The accessibility of these sites gives them a very high value for landing fields, if their present uses for national purposes does not prove to be an insuperable impediment to their use for commercial flying. The proposals shown on the Plan indicate that it is necessary to go farther afield for large airports, but this will not mean greatly increasing the inconvenience

of reaching the air terminals if proper provision is made for new speedways between the terminals and the populous centers. It does not necessarily follow that the more distant sites will be cheapest notwithstanding that the land is much cheaper to acquire and in some cases to develop. Accessibility has to be taken into account in estimating values. It is believed that the number of sites recommended for airports in the Regional Plan is sufficient to serve prospective needs of this system of transportation for many years in regard to site, surroundings and access combined.

Commercial aviation as a means of providing convenient and profitable travelling facilities will only be successful when the high cost of properly equipped airports is met. The development of the service is likely to be hampered more as a

Photo by William Frange

DOWNTOWN MANHATTAN AND BROOKLYN, FROM GOVERNORS ISLAND

The diagram on page 370 shows that the existing skyscrapers would not interfere with the use of an airplane landing field at the south side of Governors Island.

result of the absence of this provision than it is by any difficulties of perfecting the airplane itself.

Whatever the advantage of high buildings, they are likely to prove an obstruction to aerial transportation and to present difficulties in developing airports near to the central areas. Because of their existence in Manhattan and in the centers of Brooklyn, Queens and the Bronx, it seems better to have the landing fields some distance away and to spend the money saved in acquiring more distant, as compared with the nearer, fields in the development of speedways. If it happens that speedways are needed in any case to facilitate movement of motor traffic along radial lines, the whole cost of these speedways should not be set against the landing field and the capital required for their development will not be a speculation based on the

prospects of aerial transportation. A speedway has been constructed for a considerable part of the way between the Holland Tunnel and the new airport in the Newark meadows. Improvement of the road approaches to other proposed sites are suggested in the Regional Plan as parts of the system of major highways.

Highways.—The Plan contains a more detailed presentation of the highway and street system than of other ways of communication. Highways and streets are jointly owned or controlled by the public authorities and private individuals. As rights-of-way they are necessary for the utilization of land adjacent to them. This is not only for access to the buildings but also for construction of the underground services necessary to serve the uses of buildings. Railroads on the other hand are private property and the public has no right of use of their right-of-way. Their extension and development is a matter for the companies who own them, subject to public service regulation. Except in such cases where the right-of-way of the railroad passes over a street, as in Park Avenue, New York City, there are few complications between the railroad and the buildings of the city, such as exist in connection with highways.

In the description of the highway system shown on the Plan, it is pointed out that one of the benefits of the Regional Plan is that it presents a completely coordinated and classified system of highways. To have a perspective of such a complete system in an urban region—a system so classified that each part is not only related to the whole but is appropriately designed to function as a unit—is essential as a basis for public expenditures on highway improvements.

It is obvious that several subordinate classifications should be made in city and subdivision plans for the areas intervening between the main highways. Much of the cost which it is necessary to incur to develop a major highway system can be met out of savings which could be made as a result of making minor highways fit in with actual needs instead of with some hard and fast rule based on the assumption that every street must carry through traffic. The great majority of local streets are too wide for the limited purposes for which they are used or likely to be used. Pavements in the majority of local streets in residential neighborhoods should be narrow and lightly constructed, and so planned as to discourage through traffic. In business areas the provision of alleys and front parking space on private property would be a more equitable way to provide facilities for standing cars and trucks used for trading purposes than by adding to the width of highway and street pavements.

Problems of Land Utilization

In the Plan, land has been classified for different kinds of close and open development. The purpose of this classification is to indicate the adaptability of the land for varied uses, such as industry, business, residence and recreation, rather than to

specify the actual areas that should be defined in city and village plans for these uses. The selection of the areas designated on the Plan has been made with due regard to the distribution of population, means of communication, topographical conditions and other existing physical factors that influence different uses in different places; as well as to the changed conditions that are likely to arise from future extension of communication facilities and from the effects of planning and zoning which are helping to modify the forms and directions of growth.

Influence of Planning on Changes.—Although proposals will be made in the second plan volume for improvements in regulation of land uses, the suggested distribution of uses shown on the Graphic Plan does not indicate any radical change in the directions of growth. It is anticipated that the character of any such changes will depend in a large degree on the extent to which future developments are planned and regulated. It is believed also that the tendencies in the future will be towards more careful planning of physical growth than has been the case in the past, and the Plan has been made on this assumption. But even were planning to continue in its present unco-ordinated form, industrial and residential developments are not likely to spread more or less widely than is anticipated in the Plan. Under average conditions a community diffuses itself over as large an area with an ill-balanced combination of congested and sparsely built areas, as with a well-balanced arrangement of uses and densities. If the Plan anticipates what is reasonable and proper in development and suggests methods of preventing bad forms of growth, it enables the community to save large sums of money and to avoid disorder and inconvenience, but actual distribution over large areas will not be greatly different in the one case than the other. It will only differ in the quality of its parts, according to the wisdom or lack of wisdom of the community in regulating its growth. With careful planning congestion in one place and wasteful scattering of buildings in another place can both be prevented.

Location of Slaughter-houses.—One of the examples of the bad arrangement of land uses is the somewhat indiscriminate location of the slaughter-houses of the central part of the Region, in relation to the means of transportation and the economic development of land. If the City of New York were to be planned anew, it could not develop a more unintelligent system than that which now exists in regard to the slaughter and distribution of fresh meat. From the highest economic and sanitary points of view, probably nothing is more desirable in the interests of the community than that the whole system of slaughtering and distributing meat should be organized on a modern scientific basis. The present system is long out-of-date for a much smaller population, and is becoming more out-of-date with every increase in population. One might conceive as a possibility the creation of a new abattoir city fronting on the harbor of New York in the most accessible position available, where up-to-date abattoirs and the most efficient transportation arrangements would make the food city of the Region a monumental feature. Such a possibility is perhaps less

remote because of the very fact that present conditions are becoming less and less endurable to those who are primarily interested. On this subject, suggestions will be made among the specific projects of the Plan in Volume II.

Uses of Land Fronting on Main Highways.—One of the questions of relationship between ways of communication and land uses that has raised a serious problem for communities and owners of land is that of how to utilize to the best advantage the land fronting on new arterial highways. In the description of the Regional Plan reference is made to the fact that wide parkways have the effect of promoting

Courtesy, Commissioner of Highways, New York State

JERICHO TURNPIKE, LONG ISLAND

A danger point in land development comes after the improvement of arterial roads. What happens to the land abutting on this road will determine the character of development of the whole surrounding neighborhood in the future. The buildings on this stretch of the Jericho Turnpike should be set back from 30 to 50 feet.

residential development along their frontages and the concentration of business at important intersections only. But whatever is done to acquire sufficient land to build new parkways will not solve the problem of how to utilize the enormous frontage of improved public highways that will be created in any event.

The tendency has often been to assume that these frontages will be needed for business uses and to leave them unrestricted in platting or zoning. The result has been that many fine tree-lined roads have become spotted with filling stations, repair shops and billboards. They will never become good business streets as there is not enough business to fill more than 20 per cent of their frontages and they have become

very nearly ruined for residence uses. Witness sections of the Merrick Road and of the North Hempstead Turnpike in Nassau County.

The major traffic streets represent about 25 per cent of the total street mileage of a community. Assuming the frontages on all traffic streets to be occupied by business and all the other street frontages to be occupied by dwellings on 50-foot lots, and assuming five persons per dwelling there would be 2.5 feet of business frontage per person, which is from two and one-half to five times the amount of business that can be supported. Figured another way, the use of all major street frontage for business would devote 25 per cent of the whole area to business; this gives at least five times as much business area as experience has shown to be actually used for business.

Nor is it valid to assume that all of these frontages along traffic arteries that cannot be absorbed by business will be needed for apartment sites. In a suburban community it is unusual to find more than 12 per cent of the population in apartment houses. To house 12 per cent of the community in apartment houses will surely not require more than 4 per cent of the area. If we allot 5 per cent of the community's area to business and 5 per cent to apartment houses and segregate all business and apartments on the major streets and boulevards, only 40 per cent of these frontages will be so utilized.

In any suburban community, therefore, it is quite clear that we must assume that at least 60 per cent of the frontage along main traffic streets, boulevards and parkways must be devoted primarily to private dwellings.

One of the problems in neighborhood and community planning is to find ways in which these traffic frontages not needed for business may be utilized for residence purposes, either dwellings or apartment houses. The ideal solution is to provide either a parkway consisting of a road in a strip of park land or alternatively, where a parkway is not feasible, a wide boulevard with service roads and broad planting strips.

Improvement Likely to be Slow.—It appears inevitable that progress will be slow in getting adjustments made in the direction of improving the balance between circulation, land uses and building bulks. Conflict of interests between the community and private owners will always exist, and the best that can be hoped is that circumstances will reveal, to a stronger degree in the future than in the past, that these interests are really harmonious. Ideal government, wherein the governors are inspired solely by the public welfare and are therefore indifferent to all forms of selfish pressure of their constituents, and wherein all judgments are based on sound knowledge, is not to be expected. The most perfect plan will be imperfect in proportion as government is imperfect, because a plan is merely an instrument in the hands of government.

A plan will not prevent a city from becoming a victim of occasional evils. For example, irregularities in building heights and densities, and recurrent congestion

are likely to continue and to require constant study and application of remedies. It is as natural for the city as for the human being to be subject to the ills of its own making or of the weakness inherent in its system. But with the aid of a plan the city can build up its power of resistance against the evils that are likely to arise, prevent those that are preventable, and obtain the knowledge of conditions and methods necessary to apply sound remedies when needed.

Common Difficulties of Problems of Circulation and Land Uses

It is obvious that all forms of transport, transit and traffic involve the use of large areas of land. The intimate relation between land used for movement and all other land will not be questioned and does not require explanation. It is obvious also that the character and density of industrial and residential growth influences the character and extent of facilities provided for movement in a particular area, and vice versa. These aspects of the problems have been discussed in the regional survey and are dealt with in the descriptive summary of proposals. One feature of their interdependence, however, which is not so clear and will bear some further discussion is the extent to which their common difficulties require a common solution.

The Causes of Congestion.—For example, what is called congestion has its roots in these common difficulties. The serious prospects which confront the City of New York if congestion is allowed to grow are indicated by the statement of a leader of industry, Mr. Irving T. Bush, who says: "No one can visualize with equanimity Manhattan 50 years hence, if we continue our present course, unless the result should be that the cost of carrying on business becomes so great that the growth of the city stops."[1]

The causes underlying congestion in New York are, in combination: overbuilding on the land, defective distribution of uses of land and buildings, and ill-balanced arrangement of transport and transit facilities and streets. Each of these things may separately cause some forms and degrees of congestion, but it is where all three are present that congestion is worst. A skyscraper city may have less street congestion than one with low buildings because of the latter having the more defective arrangement of streets and transit facilities. An area may be overbuilt, but if its business functions are perfectly arranged so that they can be carried on with the minimum of travel, it may be less a cause of harmful congestion than one which has less building but more defective arrangement of functions. The same factor, namely, the presence of three intricately related causes, underlies the reasons why street widening by itself is not a remedy for traffic congestion or haphazard decentralization is not a remedy for population congestion. In the first case, all the advantages of street widening may be lost if the uses and bulks of buildings over a wide area, and not only those adjoining the street, are not adjusted to the street system. In the second case, all

[1] "The Congestion Problem," *North American Review*, September, 1928.

the advantages of a more open, as against a crowded location, may be lost because bad distribution of uses and transportation facilities in the open area result in changing the place and character of congestion and not in relieving it.

To the superficial observer the narrowness of streets or highways appears to be the sole or primary cause of congestion. Probably it is the prevalence of this view that is responsible for so much effort being directed to the widening of the highways and so little to removing the other causes of congestion. Seeing the streets congested it is natural in the absence of studious inquiry to assume that the reason they are congested is that they are not wide enough to serve the buildings fronting them, together with the needs of through traffic. But it will frequently be found that cities with wide streets are as congested, in proportion to building and population densities, as cities with comparatively narrow streets; and, moreover, that widening streets does not in itself, except for very short periods, lessen congestion. It is apparent that doubling the width of a street, or double-decking it for the same width, will not lessen congestion if the traffic use is doubled soon after the increased capacity is provided. And so long as the street system (apart from widths) is badly planned and is combined with overbuilding and an ill-assorted arrangement of industry, business and residence, widening of streets can do no more than temporarily relieve congestion. Indeed it may increase it, if the widening is made the excuse to increase the over-building and further extend the disorderly arrangement of functions.

The financial section of Manhattan is not more congested than other parts of the island that have much lower buildings and wider streets on the average—among the reasons being that it carries on a group of closely related business functions, has no through traffic and has transit facilities radiating in every direction. In this and other sections it might be and, indeed, has been, claimed that congestion is the result of too narrow streets. If, however, the streets could talk, would they not disclaim responsibility, for were they not in existence before the buildings? This being so, should not the buildings have been adjusted to suit the existing street widths rather than the street widths changed to suit the buildings after they were erected? We see then that congestion is not caused by any one thing—such as narrowness of streets—but to the lack of adjustment of all forms of circulation to land uses and densities over wide areas.

Where Transit Facilities Fail.—Perhaps the most prominent instance of the futility of attacking the problem of congestion in one aspect alone is seen in the results that have attended the development of greatly extended and more rapid transit facilities as a means of relieving congestion. These facilities have temporarily relieved congestion, but in the long run have created new forms of congestion, so making the remedy worse than the disease. Because of failure to deal with these factors already mentioned, and to consider them together, the situation is such as to give rise to responsible statements that all the money and effort being expended are

bringing the city no nearer a solution. Here are two editorial comments that are typical of intelligent public opinion:

"Everything known to engineering science has been done, and is still being done, to feed the congestion at the metropolitan center until it has assumed proportions that appal even the least thoughtful observer. . . . With every new means of rapid approach to the heart of the city more thousands pour into it, overtaxing the accommodation as soon as it is made available. In the meantime large areas within the metropolitan district remain empty or grossly underpopulated."[1]

"We have an endless chain: more tall buildings require more subways; tunnels and drives encourage more tall buildings. With every new skyscraper, we have more street congestion, more congestion underground, more sidewalk crowding and more motor accidents."[2]

Another comment, in which the combined effects of overbuilding and means of transportation are noted, is the following which appears in an article on skyscrapers:[3]

"The erection of taller structures has inevitably resulted in a traffic problem, for which there is as yet no adequate solution. As a matter of fact, as long as present means of transportation are in vogue, congestion will doubtless be present, for it is much easier to create the centralization that causes the congestion than it is to open up new traffic lanes. There is little hope of decentralization, and the growth of certain popular zones only serves to spread the congestion over larger spaces."

Having made these quotations which are, in part, based on the evidence of the regional survey and bear out its conclusions, we present some constructive ideas on the same subject, extracted from a report by Mr. Frederick Law Olmsted, made to the Regional Plan Committee in 1925. The following quotations made from this report indicate the close parallel that exists between congestion of transportation and population densities. Discussing this parallel, Mr. Olmsted says:

"Just as we know that the optimum population of (say) Manhattan lies somewhere short of 'standing room only'; so also we know that there are limits to the amount of passenger miles of transportation per annum per capita which is desirable and profitable. The total number of man-hours per annum devoted to designing, financing, constructing, operating and riding in and waiting for the various kinds of passenger transportation devices in the New York district now averages per capita a great deal more than was the case a generation ago, leaving correspondingly less time and energy for all the other things. No one can say with any assurance whether the present percentage of the total time and energy of all the people in the district which is devoted to the business of hauling and being hauled is approaching or has passed the optimum in the present state of human skill; but we know there is a limit somewhere. It is clearly necessary that on the average the amount of time consumed in transporting and being transported should leave a few hours a day for sleep and meals and work and amusement and education.

"Everyone will agree to this, but how determine the optimum?

"The only approach to an answer that can ever be given authoritatively is by the entire people of the New York region. If and when they get to the point where enough of them can't or won't

[1] *New York Herald-Tribune*, December 30, 1928. *New York World*, February, 1929.
[2] *The Index*, published by the New York Trust Company, January, 1929, page 16.

PANORAMIC VIEW OF THE HUDSON RIVER

stand for any more time devoted to the business of hauling and being hauled, a sufficient number to check the increase of transportation will then quit, either by going in larger proportions to live near their work or work near their dwellings or by going to live and work in some other part of the world where the transportation tax in time plus money plus nervous strain is less severe. That would mark the maximum of transportation burden per capita, and it is fairly safe to assume that the optimum would be considerably short of that point.

"The main reason why such a checking of increasing transportation burden cannot be expected to take place at the optimum is that the burden of cost in time and money does not fall with sufficient directness on those whose decisions determine the amount of transportation that has to be done.

"For example, a large part of the daily passenger transportation consists of hauling people from hired dwellings in outlying districts to workshops in Manhattan or other relatively central localities where many workshops are concentrated. These workers cannot live near the central workshops because there are not sufficient nearby dwelling places within their means and otherwise available. The workshops are not moved into decentralized locations adjacent to a sufficient number of suitable dwellings because, among other reasons, their proprietors do not now directly feel the full burden of transporting their workers.

"In a decentralized location within walking distance of sufficient prospective employes they would in many cases make little saving in the big item of pay-roll, despite the great saving to the community in reduction of the burden of transporting their employes. One reason for this is that the saving in carfares to the employes would probably be less than what their transportation now costs the community, the excess cost now being borne partly by short-haul passengers, partly by public utility security holders and partly by the general taxpayer. Another reason is that Union rules are apt to fix the same rates of pay both for the workshop to which the employes have to travel a long distance and one near their dwellings. Why should the proprietor of the central workshop worry about the transportation burden under such circumstances?

"Take another case. It has been urged with apparent seriousness that the amount of daily radial transportation of passengers back and forth across the Hudson between Manhattan and Jersey, as a

NTAIN IN THE PALISADES INTERSTATE PARK

Courtesy, Palisades Interstate Park Commission

concomitant of the concentration of so many regional activities in Manhattan, has already passed the optimum; that the most important effect of further increasing the facilities for such transportation would simply be to stimulate further concentration and further multiplication of this burdensome daily traffic; and that it would be better regional planning to refrain from building more tunnels or the proposed Hudson River bridges, with the deliberate intent of checking further excessive centralization by permitting the radial daily transportation on which it is dependent to choke itself in the present channels.

"Of course, theoretically that would be one way to limit the increase in the amount of such transportation. The limit would be fixed by the amount of physical jamming the people could stand in the arbitrarily limited transportation equipment. The suggestion, even if seriously made, is utterly academic, because there would be no chance in the world of getting enough public opinion behind such an arbitrary limitation to make it hold for a minute.

"But it is not inconceivable that the public would stand for the exertion of an artificially strengthened but elastic, economic pressure against indefinite expansion of the daily rush in and out of Manhattan."

Control of Density.—After discussing the factors that promote or retard the intensity of population growth, which are dealt with in Volume II of the regional survey, Mr. Olmsted summarizes his point of view regarding the failure of added transportation facilities to relieve congestion and the need of preventing by "social control" the densities of population going beyond an acceptable optimum:

"In city and regional planning, society is not hopelessly condemned to the acceptance of indefinitely increasing size and density of urban population up to that maximum possible limit at which the evils of congestion shall have so far exceeded its benefits that human endurance can bear no more. That is the logical end of the losing fight that merely tries to mitigate the evils of such congestion by increase of transportation facilities and other devices of 'skill,' for making life in congested areas less

intolerable and less destructive to the finer human values than it would be otherwise—devices which simply raise the limit of the maximum without making the approach to it any less miserable.

"On the contrary, it is a wholly normal thing for a community to arrive at a generally held conception, even though a rather vague and undefined and largely subconscious conception, of what *are* optimum densities of population, and by social, legal and economic pressures to prevent densities from going very far beyond that acceptable optimum.

"The question of what really are the optimum densities of population for a given or prospective state of human skill is so complex a problem that its determination and the enforcement of arbitrary limitations in strict accordance with such a determination cannot safely be entrusted by society to any single agency, however wise and benevolent; but must be largely left, as they always have been, to the interplay of diverse voluntary decisions by the individual members of society acting under numerous social, legal and economic pressures which society alters from time to time in response to apparent dangers in the actual trend of things.

"We are now at a period in the history of civilization and of population densities when there is manifest danger of seriously over-running the optimum densities, especially in great cities; and therefore the benefit of any doubt should be given to measures which tend to check increases in density of population and concentration of human activities rather than to those of reverse effect.

"Any economic adjustments are dangerous, at such a time, which needlessly remove any of the economic burden involved in greater densities of population or in such related matters as the increase of centripetal transportation, from those who receive special benefits from such increases and in response to whose choices they continue."

Streets, Parks and Zoning as an Entity in Planning.—Mr. Olmsted's statements give emphasis to the fact that the planning and control of land densities and transportation facilities have to be approached as one problem. Another aspect of this question of relations between movement and land uses is that of the even greater intimacy between streets, parks and building uses, densities and heights. Mr. Edward M. Bassett deals with this aspect and shows at the same time the legal quality of streets and parks, in the following statement prepared for the guidance of the staff of the Regional Plan:

"City planning, town planning or regional planning is land planning. It is a mistake to determine on streets without regard to parks and zoning, or on parks without regard to streets and zoning, or on zoning without regard to streets and parks. They are interdependent.

"Streets and parks have a character that is all their own. They are the most highly protected and most permanent form of public ownership in land. A municipality does not own its streets and parks. It establishes them and holds the title to them. But the community represented by the state owns them. This is why the municipality has no better right to erect a building in the public streets than a private person has. The municipality has no right to put up structures in a park other than those connected with public recreation. If it abuses its trust by erecting improper buildings in a street or park, a private landowner can stop it with the help of the courts. In all the states, streets and parks can be dedicated—that is, the municipality can obtain title without a deed and without condemnation. Not so with sites for public buildings. The only way that it can obtain title to sites for public buildings is by deed or by condemnation. A municipality cannot sell a street or park without consent of the state. But it can sell its sites for public buildings the same as a private individual. These quali-

ties of streets and parks show that they represent a fundamental sort of community ownership, quite different from the ownership of sites for public buildings. The municipality owns such sites much the same as a private owner possesses his private land.

"This fundamental and unique character of streets and parks protects them not only from private but from municipal encroachment. Accordingly they are hedged about with the most complete protection that the state can employ. The people must have access to them at all times. The availability of private land to the owner depends upon the constant and perpetual openness of the streets and parks.

"Private lands are bounded by streets and parks, and the kind of use that can best be made of private land depends upon them. The depth of lot and the size of blocks are determined by the street and park locations. The establishment of narrow streets with small blocks imposes a limited use on the lot. Industry, especially heavy industry, needs a generous block size and street width. Business localities similarly need to have block sizes and streets adapted to the requirements of business. Again, multi-family residence units need different widths of streets from detached house districts. Main traffic thoroughfares must be much wider than side streets. These considerations show the intimate connection of street widths, open areas and block sizes with zoning. For zoning is the regulation of the height, bulk and use of buildings according to the needs of different districts and in relation to open areas of streets and parks.

"Of a different character but often of equal importance are the locations of public buildings and of utilities for transportation. The former include civic centers, markets, court houses, hospitals, municipal office buildings, schools and fire engine houses. The latter include railroads, ferries and sewers; water, gas and electrical supply; telephone and telegraph systems. These two groups of problems need to be considered in planning at the same time as streets, parks and zoning, but they require to be separately dealt with under the state laws and in the execution of the Plan."

What Mr. Olmsted and Mr. Bassett have said in these reports constitutes, in part, the philosophy on which the Plan was prepared.

Centralization and Decentralization

As pointed out in the regional survey[1] all community groupings are centers and all urban growth a form of centralization. Therefore the use of the term "decentralization" is a misnomer unless the intent behind its use is to entirely break up compact communities however well planned and arranged. In centralization we may have a desirable as well as an undesirable degree of concentration. What is needed is to arrest it from reaching an undesirable degree or quality in relation to industry, residence or business. To do that an indiscriminate process of so-called "decentralization" will be of little benefit. What appears to be wanted is:

First—Diffused re-centralization of industry with the objects of lessening the density of congested centers and of creating new centers.

Second—Diffusion of residence into compact residential neighborhoods throughout the whole urban region integrated with the industrial sections so as to reduce distances between homes and places of work.

[1] Regional Survey, Volume II, page 30 ff.

Third—Sub-centralization of business so arranged as to provide the maximum of convenience to residents.

We have to keep in mind the three processes, for the reason that widely distributed diffusion of industry is less desirable than the re-centralization of industry in well planned industrial sections; decentralization of residence in the form now existing with its increasing "friction of space" is less desirable than well arranged diffusion of residence in all areas; and diffusion of business in isolated units is less desirable than the creation of business sub-centers, as a means of lessening centralized congestion. They are referred to here in the above order because industry (including major business or commercial activities) should be regarded as preceding residence, while residence has to be established before retail business, in the course of development. We will refer briefly to the three classes of use here because of the relation of the Graphic Plan to industrial, residential and business distribution, but the question will be more fully discussed in Plan Volume II.

Diffused Re-centralization of Industry.—From certain economic points of view it is evident that there is need in the New York region of preserving some residential quality in the predominantly industrial areas and of securing further industrial penetration of the areas that are predominantly residential. Without this the Region will continue to expand in such a way as to cause the maximum inconvenience to its inhabitants, and a high cost of maintaining transportation facilities and production in comparison with smaller cities. It is questionable, however, if any great social value is to be obtained from merely encouraging industry to move outwards from the center under present conditions.

In the preliminary report of the city planners[1] and the subsequent report on the economic survey by Professor Haig[2] hesitation was shown in presenting any definite conclusions regarding the extent to which dispersal of industry was occurring or likely to occur. Subsequent studies have not revealed any extensive or co-ordinated movement on the part of manufacturers, from crowded centers to open areas—but merely confirmed the fact that substantial isolated migration of certain industries, or "packets of functions" in other industries has been taking place for many years. On the other hand neither of the above reports arrived at any definite conclusions as to the value that could be attached to dispersal in the circumstances under which it was taking place.

The planners' report expressed a definite opinion on one point regarding which every inquiry made by the Regional Plan has produced confirmation. This point is that whatever merit or demerit there may be in transplanting industries and population under prevailing conditions it unquestionably affords opportunities for better planning and avoidance of the evils of congestion. If it could be assumed

[1] See Regional Survey, Volume VIII, page 192.

[2] See Regional Survey, Volume I.

that these opportunities would be taken advantage of when, for instance, industrial dispersal occurs, there would be no question regarding its advantages to both communities and manufacturers. What makes the outward movement as now proceeding so uncertain in its results is that it is most frequently accompanied by forms of development in the new areas which reproduce the evils that have driven the industries away from their old locations.

In both the preliminary report and the report of the economic survey it is recognized that Manhattan Island is bound to continue to be the center of certain major economic activities. In the first report it is stated, "the advantages of centralized locus are undeniable for many of the functions carried on in the Region." Professor Haig confirms this statement and qualifies it to the effect that with increase in the degree of centralization offsetting disadvantages arise more and more rapidly, tending to force decentralization of those functions which least withstand these disadvantages under competition. One of these disadvantages he describes as a "growing friction of space" between home and place of occupation.

The problem as it has been considered in the Regional Plan is that stated in both reports, namely to facilitate relative diffusion of centers for those functions and groups of functions whose diffusion into new centers will bring the greatest gain and the least loss, and to facilitate a higher degree of centralization for those functions the squeezing out of which from present central locations under competitive pressure would involve greater losses and lesser gains to the whole.

The proposals for the distribution of land uses on the Graphic Plan are made on the assumption that considerable changes will occur in industrial location, and that the tendencies towards industrial dispersal will increase. It is believed, however, that the benefits of such dispersal as may take place will depend more on the measures taken to prevent misplanning of new industrial centers than on the mere fact of removal of an industry from an already congested to an open area where nothing is done to prevent the recurrence of the causes of congestion.

Diffusion of Residence.—The desirable diffusion of residence is that inter-penetration of all parts of the Region that brings the population in convenient contact with employment and education centers and recreational opportunities, subject always to the maintenance of a healthy density of building on each acre of land. To attain this diffusion it is essential that efforts should be made to improve the conditions of housing accommodations in the areas already built upon as well as to prevent the recurrence of bad conditions in new areas. One of the two ways to counteract the tendency to separate homes and places of work is to make housing more wholesome in its conditions in the central areas; the other being, as already indicated, to promote the movement of industries into well-planned suburban and rural areas. These two questions are fully dealt with in the regional survey.[1] Their solution depends

[1] Regional Survey, Volumes VI and VII.

on the action of the city and village governments in simultaneously remodelling residential areas in their crowded centers, and in controlling new developments in accordance with comprehensive plans and adequate building codes in new areas. The building of new satellite towns on the lines recommended in Plan Volume II is the most certain way to secure the benefits of combined industrial dispersal and healthy diffusion of residence.

Sub-centralization of Business.—It is unnecessary to say more about the movement of business to establish itself in sub-centers than has been said in the regional survey,[1] beyond referring to its distinctive classification in relation to the movement towards wider diffusion of population and to the importance of zoning business centers at strategic points in the system of communications, instead of in straggling lines along every main highway.[2]

Carrying Out the Plan

It is obvious that the making of a plan is only a means to an end and that the end consists in the improvements made as a result of carrying out the plan. How and to what extent can this result be achieved through various agencies? Before presenting an answer to that question it will be of value to indicate what has been done as a result of the making of the city plan of Chicago in 1907.

Experience in Carrying Out the Chicago Plan

While the New York Regional Plan differs in its technical approach and comprehensive view from the original Chicago Plan, the planning of Chicago has come to assume the proportions of a great regional undertaking. The original plan of Burnham was a great architectural conception. It has been criticized as being nothing more than a dream of a "city beautiful." But for the purpose of awakening public consciousness and inspiring public action towards the ideal of more order and beauty in the city and towards later regional planning, probably no plan could be found more practicable than that made for Chicago over twenty years ago. That this is true has been shown by the attention the plan has attracted and by the improvements in structural development of the city that have been carried out in general accord with its proposals.

The Chicago Plan was in fact more comprehensive in scope as a city plan than any plan that had been made for an existing American city prior to 1907. But since it was made, entirely new conditions have arisen in connection with the growth of cities. The processes of growth and of circulation within and surrounding large metropolitan areas have been so altered in recent decades that a new orientation is given to planning ideas and enterprises. The altered conditions have resulted in

[1] Regional Survey, Volume VI.

[2] See page 141.

greatly adding to the need of elaborate schemes of zoning of private property and of developing more ample ways of communication, particularly in the form of highways over wide regions surrounding as well as within cities.

Certain experience gained in carrying out the Chicago Plan is worth noting in view of the work that lies ahead for any Plan Commission that may be promoted to carry out such proposals as are included in the New York Regional Plan. Writing on the 25th of September, 1922, shortly after the inauguration of the Regional Plan, Mr. Charles H. Thorne of Chicago said:

"My experience with the Chicago Plan suggests the necessity of reiterating on every possible occasion that whatever plans are made will be a long time in fulfilment, that immediate results are not to be expected and that consequently there should be no compromise with expediency."

The specific projects in the Chicago Plan, which have been carried out as a result of years of effort of the Chicago Plan Commission include:[1]

1. *The Improvement of the Lake Front*

The broad scheme for reclaiming the lake front for park purposes is being carried forward by the two Park Districts substantially as outlined in the original Chicago Plan. Each of the Park Districts has its own staff but calls upon the Plan Commission's technical staff for advice. For example, the proposed bridge across the mouth of the Chicago River has been designed in most of its detail by Hugh E. Young, Chief Engineer of the Chicago Plan Commission. Here there were several jurisdictions, the Lincoln Park and South Park Districts, United States War Department, the State of Illinois, the Sanitary District, the City of Chicago, and certain railroad and private dock interests, all of which have been co-ordinated by the Plan Commission.

2. *The Creation of a System of Highways Outside the City of Chicago*

The Chicago Plan Commission keeps in touch with the construction progress of outer highways through the Regional Planning Association by having a representative on that organization's Committee on Highways. The Regional Planning Association, among other things, promotes the adoption of building line ordinances in communities outside Chicago to preserve the future needed space between buildings where narrower rights-of-way have previously been dedicated. Had this latter method been followed earlier in the areas now being built up so rapidly, a tremendous expense would have been saved which has gone into the several street widening projects. This scheme was originally suggested in the Chicago Plan but was found to be impracticable within the city.

3. *The Improvement of Railway Terminals and the Development of a Complete Traction System for Both Freight and Passengers*

The Chicago Plan Commission staff participated in the detailed design of the Chicago Union Station and the Illinois Central Station projects in both of which street widths and elevations were designed and agreed upon.

The Plan Commission is now working on the project of a new south side terminal and is endeavoring to bring together the many railroad and property interests, in dividing up the railroad approaches to the City between two main south side terminals, namely, the Illinois Central and another which will substitute for the Dearborn Station, La Salle Street Station and Grand Central Station terminals.

[1] The information contained in this summary was obtained from Eugene S. Taylor, Manager of the Chicago Plan Commission, and Robert Kingery, Secretary of the Chicago Regional Planning Association.

The Plan Commission staff also gave much detailed study to the matter of freight terminals in connection with the passenger terminal plans and continues to co-operate with the railroad authorities in this manner.

4. *The Acquisition of the Outer Park System and of Parkway Circuits*

In the main the general plan has been followed by the officials of the Forest Preserve District of Cook County in acquiring a total of approximately 32,000 acres of land. Since the creation of the Regional Planning Association and a Citizens' Forest Preserve Advisory Committee these bodies are co-operating with the district and land acquisition is now going forward rapidly in accordance with a cleanup plan to tie together all of the preserve lands that can be so connected with a parkway or forest way from 200 to 660 feet in width. Inside the City of Chicago there has been established one

Courtesy, Chicago Plan Commission

CHICAGO PLAN—ROOSEVELT ROAD

View east of Michigan Avenue, showing new Illinois Central Railroad terminal, Field Museum and Soldiers' Field (Stadium).

new parkway or boulevard, namely, South Parkway, 198 feet in width, and outer drives along the lake front.

5. *The Systematic Arrangement of the Streets and Avenues within the City, in order to Facilitate the Movement to and from the Business District*

The hub of this system is a rectangle around the central business area, the east side of the rectangle being Michigan Avenue, the south side being Roosevelt Road, the west side being Canal Street and the north side being Wacker Drive.

This rectangle has been practically completed, part of Roosevelt Road needing further work and Wacker Drive needing a better connection with Canal Street to form a circuit. Michigan Avenue has been opened and widened to the north, connecting with the Lincoln Park system of drives and the South Parkway project described above facilitates the southbound movement of traffic.

The Plan Commission has carried forward the development of certain belt line arteries which are planned to keep out of the Loop the traffic that does not need to enter the Loop. Three great belt highways will encircle the city.

6. *The Development of Centers of Intellectual Life and of Civic Administration, so Related as to give Coherence and Unity to the City*

Flanking Grant Park on the south have been developed the Field Museum of Natural History, the Shedd Aquarium, the Stadium, known as Soldiers' Field and the Adler Planetarium. These have been located by the South Park District authorities in co-operation with the Plan Commission. On the north side has been located the Municipal Pier, a recreation feature, and there is now proposed, to be built in Lincoln Park, the home of the Chicago Historical Society.

Courtesy, Chicago Plan Commission

CHICAGO PLAN—LAKE FRONT

Sketch of the five-mile lake front park under construction, showing 600-foot wide watercourse.

Although incomplete, the above is a fine record of work done under a plan that has been described as a visionary conception of the "city beautiful." Much greater difficulties are presented in the New York region with its diverse political structure than in the more compact administrative unit of Chicago. But if the City of New York appoints a planning commission of the same quality as was done in Chicago, and other cities or villages do likewise; if also persistence is shown in keeping the Regional Plan before the public for a long enough term of years to give an adequate comprehension of the real character of the civic problems and the best means by which these problems can be solved, much greater achievements than those listed above will be possible in New York in coming years. It was unfortunate that

practical difficulties prevented more being done in Chicago to carry out the less spectacular elements in the Plan, such as establishing building lines (front courts), controlling the subdivision of property, and acquiring dedications of park and playground areas in subdivision plats. The communities in the New York region should take early steps to carry out the recommendations in the Regional Plan in regard to these more simple operations.

The approach to the planning of such a region so peculiar in size and complexity as that of New York must of necessity be different from the approach made to the planning of Chicago, which comprised only one administrative unit of only 196 square miles. Having regard to the many new factors that have to be considered, as well as the greater area that has to be planned, under modern conditions, comprehensive treatment has to cover a much wider field than in 1907. This necessarily limits the opportunity for detailed consideration of concrete problems.

But it always remains true, as the founder and first chairman of the Regional Plan, Mr. Charles D. Norton, so fully realized, that no plan can be complete that does not include as an important part treatment of architectural problems and some conception of order and beauty in building. It must, however, be a part, and in order of presentation and treatment, a secondary part. Until the foundation of a well-conceived ground plan is well and truly laid, no building structure or group of structures can be made good in design.

Popular Support of Planning

It has been claimed that in preparing and carrying out the Chicago Plan the greatest asset has been the public spirit of the citizens of Chicago. The existence of a strong local patriotism had much to do with the making of the plan and with the success of the efforts made to carry it out.

One advantage of limiting the plan to the area of a city is that public spirit is more easily aroused to action. In a region of the size of that surrounding New York, composed of many political units, it is difficult to create a homogeneous organization of citizens, and arouse a unified public spirit in favor of planning. The fact that the Region overlaps three states makes the problem more difficult than if it were confined to a single state. The City of New York itself is a comparatively recent political structure and has been built up out of a large number of city and village units that were formerly independent. Its enormous size alone presents a difficulty in getting united action. Whereas in Chicago the inception of the plan was inspired by the action of a small group of citizens, in New York no popular movement was behind the plan at the beginning. At the same time, the work of making the Regional Plan has helped to awaken a spirit of unity among the people of the city and of the Region, and during recent years there has been a remarkable growth of public interest in city planning.

The Plan as a Foundation for Local Action

The proposals in the Graphic Plan can be carried out in detail and in proportion as they commend themselves to the inhabitants of the Region. They should be completed in gradual and orderly steps as financial resources permit.

As already stated[1] it was desirable, and even necessary, to limit the Graphic Plan to proposals affecting the layout of the land, and to limit the Plan as a whole to a broad outline of tentative suggestions for guidance of those public authorities and private corporations who have the power and financial ability to carry plans into effect. Subject to being carefully prepared and worked out after adequate study of existing conditions and trends, and subject also to imaginative and co-ordinated treatment of the problems dealt with, such an outline is invaluable both as a picture of what is likely to happen in the future in the whole Region, and also as a basis for detailed planning of cities, towns and villages. The utility of the Plan as a basis for local action depends, in the first place, on the extent to which it embodies a comprehensive program of proposals for all ways of communication, land uses and architectural features, and not merely proposals of the kind that can be included in a statutory city plan. It also depends on due consideration being given during the evolution of the Plan to questions of government control, private rights of property and public finances, all of which have been fully discussed in the regional survey.

Need of Flexibility.—Another quality which a regional plan must possess to facilitate its local application is that of flexibility in its proposals. By flexibility is meant the degree and extent to which any of the proposals that may commend themselves for adoption may be modified without loss of their value as part of the regional plan outline. Such modifications may be made in the direction of amplifying the plan where it does not seem to go far enough, or of curtailing it where it seems to go too far, as well as of making adjustments to meet changes of condition that cannot be foreseen. The regional plan may be regarded as a carefully worked out diagram capable of being carried out with the deviations which more detailed study will show to be necessary. Yet it is much more than a theoretical pattern. As a plan it should be capable of being followed with comparatively little variation, if it were possible to start at once to put it into effect. For reasons which will be given presently we shall see that this is not possible, and that it is necessary for the plan to be flexible in its proposals in order to facilitate the making of modifications to suit local conditions, or to fit in with the requirements and operating obligations of public utility corporations. It has to visualize the needs of the future over a long period of time, during which many changes may occur to prevent the realization of parts of the plan as it is now conceived. It has to fit in with local and private needs and expediencies which will make revision of detail necessary even if the main outline is adhered to.

[1] See pages 131–135.

The plan of facilities for communication must have flexibility in two different respects: namely, in respect to the changeability of the general outline, and in respect to the modification of parts. Change in its outline should only be made as a result of continuous future study of the Region as a whole. Such a change could be made of the complete outline so as to adjust the plan to a slower and less intensive growth of population than is anticipated, by reducing the physical proportions of any one feature, or alternatively to a more rapid growth by increasing these proportions. For instance, a railroad or highway could be adjusted to a lesser or greater volume of traffic as needs demand. Changes of parts may take varied forms, such as deviation of the line of highways after intensive local study, or change of highways from one classification to another, or lessening the degree of importance of one set of proposals as compared with another set in any locality.

It is important, however, that changes should not destroy the essential unity of the plan. Therefore modifications should be made in one of the above forms with due regard to the effect of the change on the whole plan.

Why the Planning had to be Done by an Unofficial Body.—The facts that the Region lies in three states, and that there are hundreds of public authorities, as well as numerous public utility and trunk railroad corporations who operate within its borders, indicate that the making of a complete regional plan was a task that could not be undertaken by any official group, either existing or likely to be created. It was essential for the plan to be made by an unofficial advisory committee. Thus the situation is that the various governmental bodies and private corporations that have the powers necessary to legislate for and execute plans have not combined, and, for a variety of reasons, are not likely to combine, to make a plan for the whole metropolitan region; while the voluntary body that has undertaken the task has no power and cannot be given the power to carry out its proposals.

This duality of function is not without its advantages—for, as we have seen, the general character of a regional plan is such that it should be tentative and flexible and not prepared in such definite and detailed form as is required for legal application, while statutory city or railroad planning have to be definite and legally enforceable. In considering the application of the proposals in a regional plan we may begin therefore by assuming that it is better that this be a separate operation from that of making the plan, and that it should provide a basis for more detailed planning operations of both public authorities and private corporations. For example, there are features in the Plan that can be dealt with only by the Port of New York Authority.[1] While this Authority does not possess powers to deal with the local phases of city planning, it has exceptional interstate powers granted by New York and New Jersey to deal with certain railroad and port problems that are beyond the domain of a city planning board or commission. As another example the

[1] See Regional Survey, Volume II, page 205.

Gilmore D. Clarke, Landscape Architect

At Lockwood Avenue, Yonkers

Guy Vroman, Engineer — *Carrere & Hastings, Architects*

At Gun Hill Road, New York City

Gilmore D. Clarke, Landscape Architect — *Charles W. Stoughton, Architect*

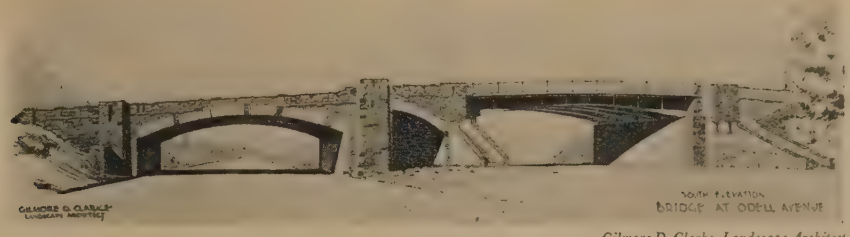
At Fenmore Road, Hartsdale, Showing Ramp

A. S. Hayden, Engineer — *Delano & Aldrich, Architects*

At Scarsdale

Gilmore D. Clarke, Landscape Architect

At White Plains



Gilmore D. Clarke, Landscape Architect

Odell Avenue Bridge, Yonkers

City of New York has special powers to plan and construct rapid transit extensions which no other municipality in the Region has or is likely to obtain, and which are not appropriate for detailed treatment in a general city plan. Moreover, the city government as well as the state governments may and do exert considerable influence over trunk railroad improvements, but only as special detached projects.

Therefore, the Regional Plan serves the purpose of including in one comprehensive outline the kind of proposals which are proper for inclusion in a plan of the Port Authority, or of a bridge and tunnel commission; secondly, the kind relating to general highway communications, zoning and land uses, which are proper for inclusion in city plans; and, thirdly, the kind that come with the special powers granted to private corporations, such as railroad companies, in extending their respective undertakings.

When the Committee has completed the presentation of the Regional Plan it might be regarded as having completed its task. This will be true in a partial degree. It will be true to the extent that the technical operation of making the Survey and Plan is complete. But the view of the Committee is that this completion represents the real beginning of the task of carrying out and further developing the Plan. Towards this extension of its work it has had part of the time of its staff devoted to the establishment of official agencies to carry out parts of the Plan. It is probable that it will project these efforts sufficiently into the future to make it certain that its proposals will be carefully considered.

Classification of Proposals for Purposes of Execution

It is appropriate to indicate here what are the official agencies to which the Regional Plan is presented for guidance and, where acceptable, for adoption as a basic outline. That question has already been partly answered in the report on Government,[1] but the answer needs to be repeated and amplified, partly with the object of making it clear what proposals in the Plan lend themselves for inclusion in plans prepared by local government bodies, acting under the state enabling acts on planning and zoning, and what are the proper agencies to deal with other proposals.

From the point of view of adoption and execution, the proposals in the Graphic Regional Plan may, therefore, be classified under five heads, namely:

First—Proposals for extensions of trunk line railroads, railroad terminals, rapid transit lines, etc., the planning and development of which are usually the function of private corporations like railroad companies, subject to special state laws and some measure of federal, state and municipal control.

(An exception to private planning and operation of such utilities exists in the case of the City of New York in connection with a large proportion of its rapid transit system.)

[1] See Regional Survey, Volume II, Part III.

Second—Proposals for harbor and waterway improvements, certain extensions of railroad facilities, freight distribution, major bridge and tunnel projects, etc., that primarily lie in the jurisdiction of *ad hoc* authorities like interstate commissions under special state laws, although involving a certain amount of co-operation with both municipal authorities and private corporations.

Third—Proposals for county highways and loop roads, parks and parkways, and, generally, for projects outside New York City, which extend over county areas and are appropriate to be dealt with by counties with the aid of the state on the one hand, and in co-operation with the city, town, borough and village authorities within the county on the other hand.

Fourth—Proposals for arterial and secondary highways, zoning, parks, platting of land and other features that may be dealt with under the city charter or state enabling acts, by the City of New York.

(The area, population and unique character of the City of New York with its five counties requires that it be classified separately as a unit.)

Fifth—Proposals for:

(a) Highways, zoning, parks, platting of land and other features that may be dealt with under planning and zoning enabling acts of the respective states;

(b) Restriction of open areas and development of architectural projects that can only be carried out through co-operation between public authorities and owners of land under present conditions of the law, and for the proper carrying out of which new legislation is needed;

(c) Planning of sections such as the Jamaica Bay and Hackensack meadow sections, which requires the passage of special laws and the setting up of special joint authorities.

These three classes of proposals—(a), (b) and (c)—are those that are appropriate for treatment in the plans of cities, boroughs, villages and towns, although no statutory power exists to deal with (b) and (c).

It has to be noted that, while specific reference has been made to only two types of proposal that require entirely new legislation, namely, types (b) and (c), comprised in the fifth group of proposals, many other features in the Plan cannot be carried out without special legislation extending powers already granted by the states. It will be seen also, from the above classification, that what has been said in the various

survey reports regarding the Regional Plan being a basis for planning by counties, cities, towns and villages is subject to the qualification that many proposals of the Plan can only be carried out by the action of other public or semi-public bodies, and in some cases by or in co-operation with private groups. A particular example of the latter is furnished by the railroad and transit proposals.

Railroad and Transit Planning

Those parts of a regional plan that relate to the railroad system, including terminal facilities, are merely in the nature of suggestions of what the railroad companies might or should do. Unless and until these proposals commend themselves to the railroad companies, either severally or collectively, they are not likely to be realizable. The placing of the railroad and transit proposals on the Graphic Plan does not mean, therefore, that there is any illusion on the part of the Regional Plan staff, as to the absence of power to give effect to these proposals as a part of a city plan. It has been necessary to include a systematic study and make an outline plan of the railroad and transit systems in order, first that the probable demands of the prospective population may be visualized in a co-ordinated system of transportation, and second that all other ways of communication, as well as the uses of the land, may be planned in harmony with such a system. Proposals regarding railroads, harbors and major transportation facilities in general must have regard to the fact that these are not merely local developments under local control but are local parts of large systems that operate far beyond the boundaries of the Region.

Co-operative and Statutory Planning

County Planning.—Before referring to the classes of government authorities that have power to carry out statutory plans under the state enabling acts it is well to draw attention to the opportunities for co-operative planning by the counties in the Region. Counties in New York State may collaborate together and form inter-county sub-regions. This permits the formation of statutory regional planning boards similar to that which exists in the Niagara area, where the counties of Erie and Niagara have for three years maintained a joint planning board for the purpose of making a co-operative plan of the two counties.

The strongest case for inter-county organization in the Region exists in New Jersey, where the group of counties lying nearest to New York City and comprising Hudson, Union, Essex, Bergen and Passaic are really one great community with an unusual number of common interests. In general, however, co-ordination of the planning activities of cities, towns and villages should be carried out within the limits of county areas. What, then, is the most desirable thing to be done to promote county organization of planning?

There are five complete counties and two incomplete counties in the New York State part of the Region outside of New York City; eight complete and one incomplete in the New Jersey part; and one incomplete in Connecticut. County-wide organization of local planning authorities can be undertaken in all three states; but in addition, counties in New York State, by virtue of Chapter 539 of the laws of 1925 with amendments, have the power to establish and finance regional planning boards, and thus promote the making of complete county plans.

An example of the former is the Westchester County Planning Federation, and of the latter, the Putnam County Planning and Developing Commission, which has exceptional powers by virtue of a separate enabling act. The Westchester type of organization has the advantage of being universally applicable to all counties in the Region without new legislation, and of containing no suggestion of possible interference with the planning powers of cities, towns and villages.

New York City Planning.—New York City possesses very substantial power to carry out plans under its charter supplemented by the general law. Before, however, any real progress can be made in comprehensive planning of the city, it will be necessary for a permanent planning commission to be appointed. The principal recommendation of the City Committee on Plan and Survey, set up by Mayor Walker in 1925, was that such a commission be appointed. In March, 1929, a bill was presented to the state legislature under the sponsorship of the Mayor to give effect to this recommendation. The bill failed of passage notwithstanding that it met with the approval of the legislature. If and when such a commission is appointed the making and carrying out of a master city plan, and the giving effect to the proposals of the Regional Plan within the city, are certain to be greatly accelerated.

City, Town and Village Planning.—As has been pointed out, the proposals that have to do with the development of highway communications and parks can be dealt with in city, village and town plans in collaboration with state and county highway and park authorities; while the determination of land uses and the restriction of heights and densities of buildings (zoning) can be effectively dealt with in the same plans by the different municipal governments. The three states have conferred powers on municipalities, under three different forms of planning and zoning legislation, to enable them to appoint planning boards or commissions and make plans. Various reports of the regional survey present details of the laws and methods of making and carrying out these local plans.[1]

Under these laws, if adopted and put in force, a great many parts of the Plan can be carried out by preventive regulation with little, if any, public expenditure. Within this class are reasonable zoning restrictions and the control of subdivision up to the point that is reasonable and proper for the protection of health, safety

[1] Regional Survey: Volume II, "Government"; Volume VI, "Zoning Laws"; Volume VII, "Laws of Planning Unbuilt Areas."

and public welfare. The protection of mapped streets from building and the purchase of areas for open spaces come in another category that involve considerable public expenditures, but much less than those involved in constructing highways and other public works.

A reasonable degree of success might be claimed for the Regional Plan if it accomplishes nothing more than the stirring up of activity in making local plans. This much, and a great deal more, has already been accomplished in the New York region.

Planning of Sections.—There are sections in the Region which have some dominant characteristic in regard to transportation and industrial adaptability, and include large areas of open land which should be planned as units. Examples of these are the Hackensack meadow section, the Jamaica Bay section, and an outlying section of Queens on all sides of Flushing. The Hackensack section lies in several incorporated areas and it needs to be planned as a unit by co-operative action between the state, the counties and the municipalities. Special powers are needed to be granted by the state for this purpose.[1] The Jamaica Bay section needs inter-borough planning and is an example of the type of planning that can only be done by a city-wide planning commission. Suggestions for planning sections including those above mentioned are contained in Plan Volume II.

Piecemeal Local Planning.—In many municipal areas in the Region local plans have been or are being made. In some cases these plans have been comprehensive in their treatment of problems, but in most cases they have been "piecemeal" planning activities restricted to zoning, street systems or parks. These planning activities have been greatly stimulated in recent years by the work of the Regional Plan Committee and by new legislation in New York and New Jersey.

A city plan should be comprehensive within its own appropriate limits, namely, those defined by the state enabling acts for planning and zoning. When such a plan is confined to zoning or to transportation proposals it will be defective or, at least, largely ineffective. This is not because either zoning or transportation is lacking in importance but because a piecemeal plan of even the most important element of the city must fail to present the best kind of treatment of its problems. It is true that in many cases a series of piecemeal or partial city plans, worked out at different times, have been so correlated as to make a comprehensive city plan in the end. This method of gradually evolving a complete plan out of a series of incomplete plans has two virtues. In the first place the citizens can better understand what is being done when one thing is dealt with at a time, while it is some advantage to their experts to be able to concentrate on one feature. In the second place a plan that is prepared in a series of successive but distinct operations has the appearance of being more economical and therefore will be more easily carried into effect.

[1] See Regional Survey, Volume IV, Appendix C.

The most prominent example of piecemeal city planning in the United States has been in the preparation of zoning plans and ordinances. While zoning should always be carried out as part of a complete city plan where this is practicable, some benefit may be obtained in proceeding independently with zoning so long as it is recognized that a zoning plan is only a preliminary step in planning. Where there is an urgent demand for zoning, and money is not available for a complete plan, it would be a mistake not to proceed with a zoning plan. What would be a mistake would be in not proceeding to other branches of planning, when the zoning is completed. Where zoning is nothing more than a tentative series of regulations prepared to prevent certain irregularities in the growth of a city and is put into effect with the main object of satisfying certain private interests, it is not of much benefit and may be injurious.

Incorporation Not Necessary to Secure Benefits of Planning.—In the past, in the State of New Jersey and, to a less extent, in the State of New York, there has been a tendency for urban communities lying within townships or towns, having large rural areas, to feel that only by incorporating as separate legal municipalities could they obtain the desired improvements or make the proper plan for their respective communities.[1]

Within recent years, in that part of the Region which lies in New York State, the laws with respect to town planning and town zoning have been so materially improved that today there is no such compelling reason for incorporation as previously existed. If the town authorities take advantage of the recent legislation, they may meet all the requirements of the parts of their areas which are urban or likely to become urban in character, in the matter of zoning and planning, and thereby avoid the further subdivision of the area into numerous small incorporated villages. The minute subdivision of territory into separate organized communities may have great disadvantages as the population increases and adjacent villages become physically merged while nevertheless remaining under separate local governments. Small incorporated areas in a town or township constitute a serious drawback when it comes to making any plan for the town as a whole, because the acceptance of the plan is dependent upon the affirmative action of so many local governments.

Where, however, the local town board is slow to appreciate the legitimate demand of the unincorporated urban communities lying within the town, and therefore fails to take the necessary action, there is no other alternative for such communities than that of incorporation.

Planning Lessens Necessity of Extension of City Boundaries.—As planning of towns lessens the necessity of incorporating new village areas, so, on the other hand,

[1] Bergen County, New Jersey, with a population of 210,703 in 1920 and an area of 235.8 square miles, had 66 townships and municipalities as against three towns and 22 municipalities in Nassau County, New York, with a population of 126,120 and an area of 273.3 square miles.

co-operative planning between adjacent cities and towns lessens the necessity for extension of the city boundaries by inclusion of adjacent areas of towns or villages. Unless the areas of towns that are adjacent to cities and villages are planned, urban growth outside the city or village boundaries may take place in forms that do not harmonize with and may be injurious to the central community. Some of the worst developments in the Region have taken place where urban fringes of growth have extended into areas which are predominantly rural in character and where the government is adapted to the rural conditions.

Many schemes for extension of cities have their chief justification in conditions that could not exist if there were co-operative city and town planning. Such schemes are usually resisted by the outside communities and, even when made possible by their consent, impose heavy burdens of cost on the city that make the consolidation of questionable value. Thus, a well co-ordinated planning program can remove the necessity of setting up new incorporated areas of small size within a town, and, obversely, the necessity of interfering with satisfactory incorporated units of area adjacent to city boundaries.

Laws of Planning in General

From what has been said in the foregoing pages it will be seen that the carrying out of the Plan involves the application of many laws. Some of these that give power to municipalities to plan and zone have been referred to; there are many others that give delegated authority to *ad hoc* commissions, railroad and public utility corporations and other extra-government or private bodies. It would be a gigantic task to prepare a description of the statutes of the three states which are involved in connection with the carrying out of all the proposals. A description of those concerning railroads, terminal railroads and rapid transit lines alone would be voluminous, and a mere enumeration would serve no good purpose.

Some of the proposals in the Plan cannot be carried out under present laws in any state, and others can be carried out in one state but not in another. All proposals are put forward on the assumption that they either be carried out under existing laws, or under new laws that it would be constitutional and proper for the state to pass in the event of a popular demand.

Cost of Carrying out Plans

No estimates of cost are submitted with the Regional Plan but the Plan has been prepared with due regard to the financial considerations which are involved in carrying it out. It is for those public authorities who adopt any of the proposals in the Plan, with such modifications as they may consider expedient, to prepare estimates of the cost which will be involved. The cost, in any case, will be very great.

It is estimated that since the publication of the Chicago Plan, which was prepared by an advisory committee, about $300,000,000 have been voted for public works in conformity with the plan. Over twenty years ago, when a plan was made for the improvement of Washington, it was estimated by the late Mr. Charles McKim that it would cost $100,000,000 to carry it out in perhaps one hundred years. Without the aid of any special legislation to facilitate the execution of the plan nearly half the amount contemplated by Mr. McKim has been spent in a quarter of the time. In each case what has happened is that the work that had to be done has been done more intelligently and, therefore, more economically because of the plan.

"The money which will carry out the Plan of New York," said Mr. Charles D. Norton, "is the money which New York will spend in any event, whether it has a plan or not. With a city plan expenditures can proceed along permanent lines; without it, public expenditures are diverted into projects which are not enduring, and are therefore wasteful."

It is necessary of course for every plan to be based on sound principles of economy. Those responsible for carrying out plans must have assurance in advance of doing so that the expenditures are necessary and justifiable in the public interest.

Cost of Circulation Grows More Rapidly than Population.—It is pointed out in the regional survey[1] that, as population increases in volume, transportation facilities have to increase in greater volume. Mr. J. Rowland Bibbins gives the following confirmation of this fact as a result of studies of past growth, thus: "While large city populations doubled in about 30 years, land values increased about three times and railroad, freight and passenger traffic of the country seven or eight times."[2]

Owing to the immense cost of maintaining the equilibrium between transit facilities and population growth, it is wholly improbable that New York and other adjacent communities can continue to develop rapid transit lines without the aid of both benefit assessment on the areas served and an adequate fare to pay for the cost of the service. The contribution from assessment will be needed to lessen the burden to the traveller and the charge of an economic fare will be necessary to keep the assessment within reasonable and enforceable limits.

In every decade great cities are drifting into the field of the unknown in regard to their financial ability to take care of urban growth that is extending further and further away from the boundary that marks the limits of past experience. Will this mean that the balance will be redressed by the growth of new urban regions rather than much more expansion of the old?

Cost of City Planning.—With regard to the cost of carrying out the proposals that can be incorporated in city and village plans it is important to note that the parts of a plan that involve spending money on unremunerative enterprises are more

[1] Regional Survey, Volume IV.

[2] Bibbins, J. Rowland, Paper read at Engineers Club of Philadelphia, October 16, 1928.

limited than is usually supposed. Proposals relating to zoning, platting of land, or similar measures that deal with restriction of abuses of property and with the protection of health, safety and general welfare of the community—if reasonable in the eyes of the courts—may be carried out without financial outlay other than for the small extra cost of administration. It would be possible to limit a plan to remunerative improvements, plus provisions which regulate platting of land and heights, densities and uses of buildings in accordance with the police power, so that it would contain nothing that involved public expense for construction. A plan so limited would be of immense value in promoting public well-being, and, although costing little, would probably add indirectly to public revenues. All authorities that are without means to make expensive physical improvements should have such a plan prepared, and may by doing so save themselves from having later to undertake expensive projects of a remedial character. Financially unremunerative projects, which are too often regarded as the be-all and end-all of a city plan, are practically limited to three classes of improvement:

(1) Prosposals for constructing new highways or streets, diverting or widening existing highways or streets, and incidental purchase of private property and reconstruction of buildings.
(2) Purchase of land for parks, parkways, playgrounds, etc.
(3) Erection of public buildings and related improvements.

A city plan may or may not contain proposals in respect of such matters. Because the plan treats these and other features comprehensively and forecasts the needs of the community for thirty or forty years ahead, it will appear, on the surface, to contain suggestions that involve great additions to the normal expenditures of the community. But this is not so. The existence of a plan, however elaborate or far-seeing in its proposals, does not impose any obligation on the community to spend more money than it has to spend in any case to meet its normal requirements. On the contrary, it may be that the plan will indicate directions in which expenditures, that would seem to be necessary in the absence of a plan, would really be wasteful; and also, the plan may give the community guidance as to the order of importance and character of treatment of improvements. Economy will be the result.

The Regional Plan will have to face the criticism of those who look with suspicion on all schemes that involve public expenditures and who do not stop to think that the choice of citizens is not between spending money and saving it but between spending money extravagantly and without forethought and spending it wisely in accordance with a well-thought-out plan. Moreover, it is natural for the average person to get an exaggerated idea of the cost of carrying out a comprehensive plan for the reasons, first, that it is not limited to immediate needs, but anticipates the needs of a distant future; and second, that it does not present proposals piecemeal

but offers a comprehensive unified system of development. A series of separate projects may cost twice as much in the aggregate as a complete plan covering the same ground, but when the work is projected and carried out in instalments this will escape notice. On the other hand, less costly proposals, when they are consolidated in one plan, draw attention to the whole cost and give the impression of being extravagant.

Much more proof needs usually to be given as to the economic soundness of making a change towards improvement of conditions than that of adhering to some existing condition. Every new idea has to be tested on the ground of whether it will pay to carry it out; while few established practices are ever really and adequately tested on the ground of whether it pays to continue them.

Cost of Failure to Plan

Experience in many cities has shown that the cost of planning may be small compared to the cost of failure to plan. An object in planning is to prevent by intelligent anticipation the enormously wasteful processes of remodelling misplanned improvements and of being compelled to adjust zoning to a pattern of growth.

Mayor Seth Low's criticism of misguided policies of cities in making improvements is still pertinent to the situation in the cities of the New York region: "The improvement of cities seems everywhere to have been made by tearing down and replacing at great cost, rather than by a far-sighted provision for the demands and opportunities of the future."[1]

The cost of doing only what is necessary to enable a city to function efficiently that has once got behind in meeting the needs of its inhabitants would probably stagger us if we were able to arrive at a precise estimate. That enormous expenditures have to be incurred to pay for misdirected and unbalanced growth cannot be questioned. In this respect the purpose of planning is to prevent a recurrence in the future of what is so costly to cure. While the proposals in the Regional Plan will involve very great expense, they are very conservative when compared to the multitude of costly schemes that have been suggested by responsible parties as necessary merely to satisfy the alleged needs of the central parts of the Region.

Past Neglect in Connection with Transit and Street Traffic.—It has to be borne in mind that the difficulties which now exist in regard to finding money for adequate public improvements in the Region are not due to lack of financial resources, but to the fact that these resources are already so heavily taxed for the purpose of remedying the very evils a well-conceived plan would prevent.

If we could conceive of a condition in which a great and wealthy city had maintained adequate and self-sustaining transit facilities to meet its needs and had planned these facilities in harmony with a combined zoning and street plan that permitted

[1] Bryce, James, The American Commonwealth, New York, The Macmillan Company, 1924, Volume I, page 660.

free movement of traffic—outside of abnormal peak hours—and which by these means sought to obtain for its citizens the advantages of concentration without the disadvantages of congestion—then we would have a city with ample reserves of funds to carry out whatever plan was needed to give healthy and convenient facilities to its inhabitants.

It is the collective capacity of the inhabitants to so meet their problems that constitutes the basis of its economic stability—and not the wealth of individual citizens. Judged by that, New York might be regarded as lacking stability—and yet this is so far from the truth that it maintains its prosperity in spite of its continued failure to keep up with normal social demands.

It has been shown in the regional survey that the enormous sum of $3,000,000,000[1] must be spent merely to provide for the needs already created by the present population. It is the existence of this obligation that makes provision for future growth so difficult, but unless the latter provision is made to a considerable extent along the lines indicated in the Regional Plan, the penalties to be paid for past neglect will become overwhelming. Some of these penalties—like the heavy burden the city has to carry in financing transit developments—are visible on the surface; others—like the losses in fatigue due to crowded traveling and injury to business due to congested traffic—are difficult to see or estimate.

In regard to the burden of transit perhaps the greatest evil is not that the city has to bear such a heavy burden of cost for a service that could be made self-supporting, but that what it is spending will add to, rather than lessen, congestion.

Mr. Daniel L. Turner, Consulting Engineer to the New York Transit Commission and the Regional Plan, has pointed out on several occasions that the transit facilities of New York City have been misdirected into a vicious circle of transit development and congestion. Eighty-six per cent of the 1925 population of the city was more or less crammed into 97 square miles, directly served by 210 route miles of rapid transit lines; the remaining 14 per cent was spread over about 200 square miles, or 67 per cent, of the area. The greatest need for extension of new transit lines inside the city boundaries is in giving facilities to open up and develop these 200 square miles. Transit facilities should always be provided in advance of population in accordance with a comprehensive plan for a whole region. The question in the Region is not where money is to be found to do all that is reasonably necessary, but where the intelligent leadership is to be found that will divert expenditures contemplated to be made into channels that will be productive of the greatest public good.

If the present bad conditions are due to lack of preventive measures in the past, then it follows that the employment of preventive measures today is necessary to prevent the further growth of bad conditions in the future. That is so with problems of traffic as well as of transit congestion.

[1] Regional Survey, Volume II, page 295.

It would provide a startling revelation if one side of a balance sheet could be made up of the cost of maintaining street movement in New York City, in so far as it is due to the combination of overbuilding, defective distribution of uses, and ill-balanced arrangement of transport and transit terminals and facilities. These items, constituting traffic costs that a plan might have avoided, include:

(a) Cost of a large proportion of traffic regulation.
(b) Losses due to slowing up traffic and lack of parking facilities.
(c) Cost of street widening and ultimately of double decking of streets.
(d) Business losses due to restriction of traffic to one-way streets, of narrowing of sidewalks and of conversion of streets into playgrounds.
(e) Losses in time and distance due to the large extent of blighted or sparsely-built areas.

On the other side of the balance sheet, what are the items of cost which would have to be borne to prevent the above losses? They would probably include only two, namely:

(a) Cost of making a plan.
(b) Purchase of more land for streets and parks in advance of building.

In addition there would have to be the important item of losses to owners of certain parcels of land, as a result of adjustment of building bulks to street widths and court areas, and of building uses to a balanced arrangement of functions. But this last item would be counterbalanced by the gains of owners of other parcels of land, at present blighted or unused because of the overbuilding in parts.

What has been done cannot be undone. It is apparent, however, that where there is still time to plan, the effort should be made to avoid conditions that produce the incalculable losses entailed through lack of planning. It has been repeatedly argued in the regional survey that what the Region suffers from most is unbalanced growth. It is less a matter of street widths than of design of the whole street and highway pattern, plus adjustment to building densities and uses and transportation facilities. If and when inadequacy of street space is in any special degree responsible for traffic congestion, usually the best remedy will be found in widening the areas, or separating the grades, at intersections. It would be better in some congested spots to separate grades at intersections than to double deck whole lengths of street, and in others to provide wide plazas at the points where there are cross streets instead of widening between the intersections.

Deficiency of Open Spaces.—Failure to plan has meant failure to provide an amplitude of open space to meet demands for recreation. But for the hampering influences of present customs in connection with the development of land and massing of buildings, a much more liberal provision of public park and forest might have been

practicable without greater cost than has been incurred, and therefore included in the Plan. In the Regional Plan what has been proposed for the whole area of the Region—as the description brings out—is no more than has already been actually acquired or set apart by one county. In these days when the hours of leisure are on the increase, and the spreading tentacles of the city are pushing the rural areas farther and farther away from the urban areas, a much larger percentage of well-distributed

Courtesy, New York Central Lines

THE PALISADES OPPOSITE HASTINGS-ON-HUDSON

One of the most urgent and important needs in the Region is that of reserving a wide margin of land on the top of the Palisades as a permanent open space.

public parks is needed than formerly. Want of planning has been an important factor in the failure to meet this necessity. President Hoover has pointed out that this is not merely a matter of giving more joy in life by means of recreation but of helping the nation and the city to battle against immoral forces.

"Our stage of civilization," he says, "is not going to depend upon what we do when we work so much as what we do in our time off. The moral and spiritual forces of our country do not lose ground in the hours we are busy on our jobs—their battle time is the time of leisure. We are organizing the production of leisure. We need better organization of its consumption. We devote vast depart-

ments of government and great agencies of commerce and industry, science and invention, to decreasing the hours of work, but we devote comparatively little to improving the hours of recreation."[1]

The acquisition of land for parks does not necessarily mean that large sums should be spent on their development—and much money that is being devoted to artificial improvement of park areas and construction of arteries of travel through them would be better spent in buying land. Natural beauty may be destroyed by extravagant schemes to substitute artificial beauty.

New York as a National Center

Finally, in this perspective view of the problems of planning in the New York region, it has to be borne in mind that the Region has national and not merely state or local significance. It is the largest and most powerful Region in a group of metropolitan regions in the United States that may be regarded collectively as dominating the life of the nation. It is not too much to say that what these regions are, and will become, in terms of prosperity and human welfare, the nation is and will become. As a result of the scientific achievements of the past hundred years in transportation, in methods of manufacture and in building, with their effects in creating wealth and promoting concentration of commerce, industry and population, the great modern city has become stabilized on what appears to be a stronger economic foundation than the smaller cities of the past or the rural communities of the present. Science and invention have created the great cities of today, and are continuing to add to their growth and power.

While the prosperity of New York conduces to the national prosperity so also everything that enters into national progress and stability has its influence on the progress and stability of the greatest industrial and transportation center of the country. Hence agricultural prosperity or depression are problems of New York, not solely because New York has to be fed and its granaries and harbor have to be used, but also because its economic activities and industries are dependent to a large degree on the rural sources of national prosperity. The restoration of a balance between agriculture and manufacture is of interest to New York, but the solution is not to be found by the disintegration of the city or "back to the land" movement. It lies in bringing more of the quality of the country into the city and more of the organized efficiencies of the city into the country.

[1] "In Praise of Izaak Walton," *Atlantic Monthly*, June, 1927.

SKETCH OF ARCHITECT'S DRAWING FOR THE HUDSON RIVER BRIDGE, MANHATTAN TO FORT LEE
A design with one arch instead of three across Riverside Drive (in the foreground) has since been adopted.

Photo by Fairchild Aerial Surveys, Inc.

THE HUDSON RIVER BRIDGE—AN IMPORTANT LINK IN THE WAYS OF COMMUNICATION
The white lines indicate a proposed system of express highways.

II. WAYS OF COMMUNICATION

Character and Pattern of Ways

IN GENERAL, ways of communication comprise the waterways, railways and highways. The particular features of these ways, and their several subdivisions, that come within the scope of the Regional Plan are:

(a) The terminal facilities, regional distribution and connections with local means of communication of the main waterway and trunk railroad systems;
(b) The whole system of transit by rail within the Region, including trunk line railroads as carriers of "commuting" passengers, suburban rapid transit and city rapid transit;
(c) The main highway system;
(d) The co-ordination of the terminal facilities of waterways, and of all local communications by rail and road as part of a complete system.

Transportation and Transit

In certain main aspects waterways and trunk railroads are extra-regional in character and outside the scope of the Regional Plan. In regard to their terminal facilities and connections with local means of communication, they are intra-regional in

character and are dealt with in different parts of the Plan. The waterway terminal or harbor facilities are considered in the proposals affecting the utilization of waterfront lands as well as in those specific projects that deal with harbors and their approaches. Waterways have also to be considered in relation to the railroad and highway systems by reason of the connections which have to be made in these systems by ferry, bridge and tunnel over or under the waterways within the Region.

The trunk line railroads that intersect the Region are an integral part of the local communications, and therefore have important regional and local features. But it is recognized that any proposals for the extension and improvement of these trunk lines are so related to national and interstate communications, and are so much outside the control of local authorities, that any suggestions put forward must be subject to those broader considerations that only railroad companies and national and state authorities can give. With this reservation proposals are made for improvement of trunk line railroads, which constitute the most important means of communication in the Region.

A second type of railroad facility is classified as suburban rapid transit. This includes a series of routes largely along existing railroad rights-of-way, designed to serve the "commuter" traffic between the suburban areas and the main business centers of the Region and to facilitate inter-suburban transportation.

In addition, there must be throughout the central part of the Region a comprehensive system of city rapid transit lines corresponding to the New York City rapid transit systems and the lines of the Hudson & Manhattan Company between New York City and Newark. It was impracticable to show such rapid transit routes at the scale at which the map of the Graphic Plan was reproduced. They have already been treated in some detail in the survey volume dealing with transit and transportation.[1]

The transportation and transit proposals shown on the Plan are in conformity with the assumptions that:

(a) Improved transportation and transit facilities that are needed to secure more efficiency in carrying and distributing passengers and freight should be developed as a unified system that would, among other things, encourage the by-passing of the more crowded centers and also promote more circumferential growth as a means of lessening overcrowding of land along radial lines of transportation.

(b) The promotion of better transportation facilities by a comprehensive system of cross-connecting and belt lines which will permit freer intercommunication between suburban points will not be so costly as the continual building of bridges, tunnels and subways converging upon the congested island of Manhattan.

The congestion which the regional survey has shown to exist on many of the ways of communication in the Region can be relieved to a considerable extent by the

[1] See Regional Survey, Volume IV, pages 189–198.

more efficient use of existing waterway, railroad and highway connections, and by the improvement of the various terminal facilities. In rail operations this requires, in most cases, increased co-operation and a unified management. These various methods of relief will be referred to in Plan Volume II. The types of facility described in this volume are limited to those which could be shown on the Graphic Regional Plan. Certain advances in design may eventually cause the abandonment of some of the existing facilities because of their obsolescence. In the meantime they should all be used to the utmost capacity, pending the completion of such new or supplementary facilities as can be provided under a comprehensive plan.

It must be borne in mind that the local transportation of passengers during rush hours is now subject to such extreme crowding in parts of the Region as to cause improper traveling conditions. Merely to alleviate such conditions, without any provision for future growth of traffic, would require an enormous increase in facilities. For instance, it has been estimated that the trackage of New York City rapid transit lines would have to be doubled at a cost of a billion and a half dollars to enable this one type of communication route to deal adequately with the present traffic.

Highways

The highway is dealt with more comprehensively than other ways of communication, since it is so much involved with all questions relating to the utilization of land and to traffic, and is so much under the direct control of the municipal authorities. Both new types of highways and a revision of the present pattern of routes are necessary to deal adequately with the problems of street congestion.

Question of Cost

The proposals in the Plan should be considered in the light of the possible financial difficulty of carrying them out. It is impossible to give even an approximate estimate of what such a program will involve in the matter of cost. This cost, though inevitably very great in any circumstances, would be within reason if adequate zoning were carried out and the improvements were made, with sound judgment, in advance of actual needs. They are more likely, however, to have to conform to conditions involved in following the customary procedure of ignoring the connection between zoning of land uses and densities, and of suspending improvements until public pressure compels them. In that case it will probably prove prohibitive to do all that is necessary to make the transportation facilities adequate for the future population, even with all the resources of the railroad companies added to the public funds that will be available for different kinds of transportation.

But, however great the difficulties and cost may be, the fact has to be faced that, given no greater change in the public attitude than appears to be likely in the face of past experience, and accepting as inevitable the continued expansion of the urban

areas in conformity with the demands of owners of property, transportation facilities must be provided in accordance with the Plan. It may be said, however, that, if a more balanced system of distribution of industry and population along lines advocated in other parts of this report should take place than can now be hoped for, parts of the system can be so modified as to permit a great part of the cost to be avoided.

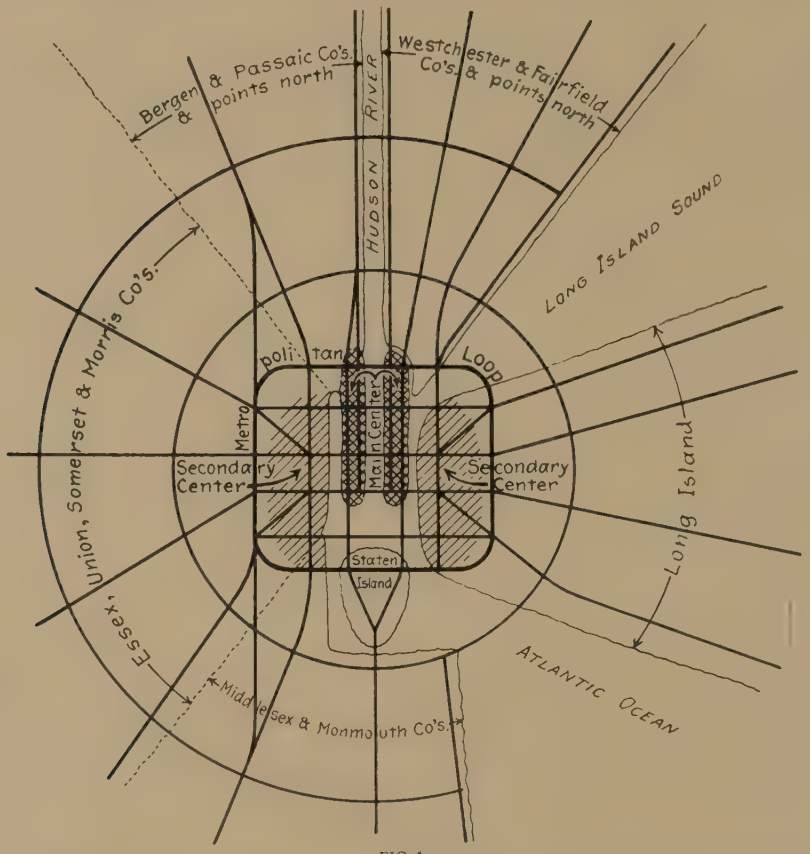


FIG. 1

DIAGRAM SHOWING THE GEOGRAPHICAL AND FUNCTIONAL SUBDIVISIONS OF THE REGION, AND A SYSTEM OF COMMUNICATION FACILITIES TO SERVE THEM

Perhaps the realization of what it will mean in the matter of cost to proceed along the lines that now appear to be inevitable will, in time, force the public to face the real facts and deal with the underlying causes of such expenditure. While it has been thought best to present complete proposals, these have been so prepared that they can be carried out in orderly stages.

One other factor must be noted, namely, that, though the scheme is as comprehensive as the staff of the Regional Plan consider to be necessary to meet requirements, it is not comprehensive in the sense of including all proposals of public authorities and responsible engineers. Were it so it would at once appear to be prohibitive in cost. Unfortunately the extravagance of separate proposals is not

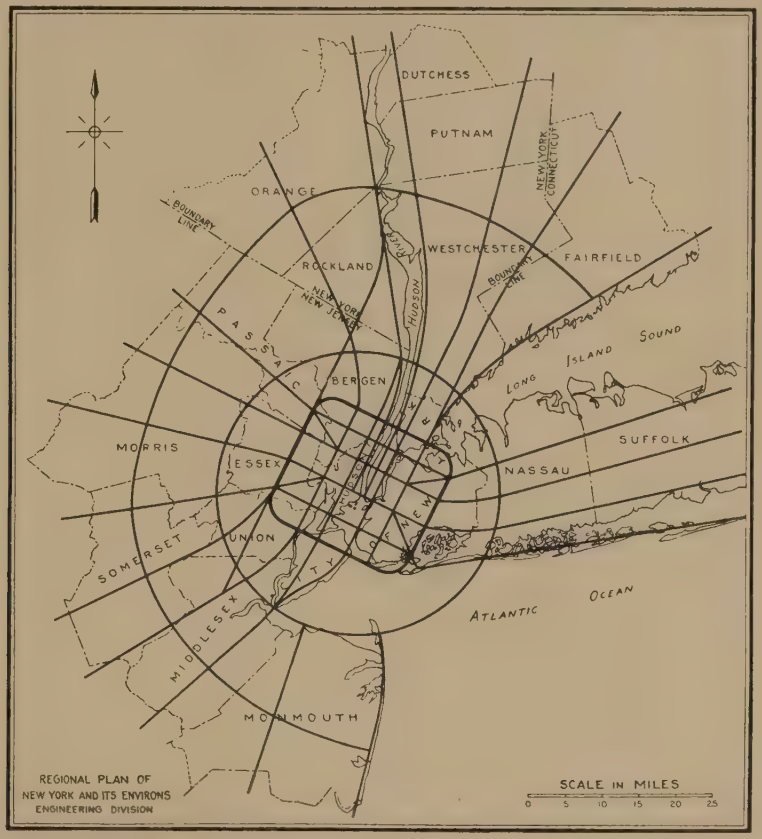


FIG. 2

APPLICATION TO A MAP OF THE NEW YORK REGION OF THE DIAGRAMMATIC SCHEME FOR WAYS OF COMMUNICATION—TRAFFIC, TRANSIT AND TRANSPORTATION

realized when they are put forward singly as specific projects. Much of what has been proposed in separate schemes would not have been seriously considered if the whole extent of the needs had been realized at the time the plans were projected, and, moreover, if the effect of carrying out the piecemeal plan had been considered in relation to the whole plan that needs to be carried out.

Geographical Center and Sub-centers

The borough of Manhattan—and particularly that part of it south of 59th Street—is generally assumed to be the main business and transportation center of the Region. In many respects this is the case. The assumption has led to the making of many proposals for radial routes which would focus on such a center, and for inner belt lines which would circulate within it or areas immediately adjoining it.

Geographically, Manhattan is close to the center of the Region, though it is all on one side of the Hudson River, which is the main waterway of the Region and splits it into two quite distinct geographical parts between which communication has been difficult. This barrier of the river has been overcome to some extent by the opening, in 1927, of the Holland Tunnel for vehicular traffic, and will have been pierced again upon the completion, in 1932, of the Hudson River Bridge under construction between West 178th Street and Fort Lee. Both of these connections have to be made at great cost. In developing the proposed system of communication facilities shown on the Regional Plan the borough of Manhattan has been considered as only a part of the regional center. This has led to a conception of the geographical and functional elements of New York and its environs as illustrated diagrammatically in Fig. 1 and described below.

The land areas of the Region are far from being symmetrically grouped around any one point, but they are sufficiently so to provide a useful theoretical pattern for communication facilities. The main center of business and commerce consists of the principal part of the Port of New York on both sides of the lower Hudson River, together with the two adjacent land areas which might be considered as the lobes of the heart of the Region. One of these land areas is the borough of Manhattan, and the other is the easterly side of Hudson County, New Jersey, extending north along the west shore of the Hudson River to the vicinity of Englewood.

There are two secondary centers of somewhat similar function and of great regional importance. On the east, separated from the main center by the physical barrier of the East River, is the metropolitan center of Brooklyn and Queens, with its hinterland. On the west, across a corresponding barrier (consisting of Newark Bay and the Hackensack meadows), is the Newark metropolitan district and its hinterland. The locations of the two parts of the main center are indicated by double cross-hatching, and of the secondary centers by single cross-hatching, on Fig. 1. In the northerly part of the Region are two wedge-shaped sectors represented by the Westchester-Fairfield district on the east and the Bergen-Passaic district on the west.

The wedge-shaped areas on the north and the hinterlands of the two sub-centers provide the appropriate places of residence necessary for accommodating the workers in the business and commercial districts. They also provide the opportunities for reserving space for country parks and the many open types of development necessary for the well-being of the population. In them are included large reservations for the

protection of water supplies and other natural resources. On the east, the open residential hinterlands include Nassau and Suffolk Counties, and on the west, Somerset and Morris Counties and the outlying parts of Essex and Union Counties.

Directly to the south of the main center is Staten Island, or the borough of Richmond, and farther south are Middlesex and Monmouth Counties which form a distinct group by themselves.

Superimposed upon the diagrammatic representation of the land areas there has been indicated a roughly rectangular system of lines within a metropolitan loop, which generally circumscribes the main and secondary centers. Outside this loop are a series of radial and circumferential lines. All of these are supplemented by a few diagonal connections. These lines represent a general scheme of communication facilities which would serve all parts of the Region, providing ready means of connection between the various urban centers and the outlying areas, as well as interchange between outlying areas without the necessity of passing through the centers.

Application of Diagram

An application of this diagrammatic scheme to a map of New York and its environs is shown in Fig. 2. It is seen to have been adapted to the actual geographical conditions with comparatively little distortion. It is not intended that this diagram should represent the specific locations of any proposals, but it shows the general types and routes of facilities which have been considered in the preparation of the Regional Plan. Certain of the lines would only be required to be followed in one type of the ways of communication while others are essential links in all types. The six parallel lines in the central part of the map, running from a northwesterly to a southeasterly direction, correspond to the following Hudson River crossings:

One—The Hudson River Bridge under construction between Fort Lee and Washington Heights.

Two—A crossing in the vicinity of 125th Street, Manhattan, and connecting on the east with the projected Tri-borough Bridge.

Three—Crossing in the midtown business district, connecting with a new crossing of the East River.

Four—For vehicular traffic, the Holland Tunnel, connecting on the east with the Manhattan Bridge to Brooklyn; new crossings near the southern tip of Manhattan for transit and transportation.

Five—A crossing of the Upper Bay, such as is included in the plans of the Port of New York Authority.

Six—A Narrows connection between Richmond and Brooklyn, connecting on the west, for vehicular traffic, with the Goethals Bridge over Arthur Kill.

It might be argued that that part of the Region east of the Hudson River will require a greater network of communication facilities than will be needed in the westerly part, because the former has a much greater population density. This discrepancy is largely counterbalanced by the fact that New York serves, in many respects, as a gateway to the whole United States, which lies almost entirely to the west. Therefore, the routes in the westerly part of the Region must serve to a much larger extent than those east of the Hudson River for the transportation of persons and goods to or from points outside of the Region.

The Trunk Line Railroad System

Requirements

In the development of the Regional Plan, the proposed trunk line railroad system has been given prime consideration, because it is a most important factor in the life and progress of the communities in the Region. The purpose has been to suggest what facilities are needed for the movement of freight and trunk line railroad passengers into and out of an area for which the 1965 estimated population is about 21,000,000. As already stated, the railroad proposals are put forward with due respect to the facts: First, that broader considerations may cause railroad companies and public authorities to promote developments along very different lines than those here suggested; and second, that the cost of the improvements will be kept within reasonable bounds according to the necessities of the case and the financial resources available. The proposed suburban rapid transit and highway systems, as well as the recommended land uses, which are described in subsequent pages, were considered in relation to the plan of the existing and proposed railroad system.

Estimates have been made of future traffic, both passenger and freight, with which the trunk line railroads will be called upon to deal. These give some idea of the load which will be placed upon the railroads. In 1923, the total of inbound and outbound freight tonnages, excluding interchange, was 69,000,000 tons, and the 1965 estimate is 100,000,000 tons, or a 45 per cent increase. Calculations have indicated that, had an all-rail connection existed in 1914 between New Jersey and New York, 26 per cent of the total railroad tonnages, including interchange, might have used it; it is estimated that by 1965 about 35 per cent of a corresponding total would utilize such a crossing. The total railroad passengers carried to and from New York metropolitan terminals in 1924 were about 243,074,000. Deducting from these the commuters (defined as reduced fare passengers), whom it is proposed should be served primarily by a special suburban rapid transit system, there remained 81,075,000 other railroad passengers. It is this type of passenger which the trunk line railroad system must continue to serve. It is estimated that by 1965 this part of the railroad traffic will total 270,000,000 passengers annually, or about 3.3 times the 1924 figure. This

estimate exceeds the total 1924 railroad traffic to and from the metropolitan terminals by 11 per cent.[1]

In addition to the traffic considerations, certain principles outlined by Colonel William J. Wilgus in his report to the Regional Plan Committee have been used as a guide. He stated that:[2]

". . . any proper solution of the transportation problem should provide for (*a*) the electrification of the trunk lines and the unification of their management and operation, (*b*) the creation of belt lines for by-passing points of congestion and delay, inducing a better distribution of population and providing means for industrial expansion, interchange and the prompt movement of troops and material in time of war, (*c*) the minimizing of the surface use of city streets for freight collection and delivery, and (*d*) the joint consideration and treatment of various types of transportation."

Proposed Plan

The proposed trunk line railroad system, as presented in the Graphic Regional Plan, consists of a number of belt lines, connections and waterfront lines and a series of proposed union passenger terminals. Some of the proposed routes follow existing trunk lines, to which additional trackage should be added as needed, and some follow new rights-of-way. The complete system is shown in Fig. 3, and its relation to the proposed suburban rapid transit system is shown on Map No. 1 in the pocket at the back of this volume. The numbers in red on Fig. 3 refer to the various routes as listed in the following description.

Outer Belt Line.—The purpose of the outer belt line is to encourage industrial development outside the central congested areas and to permit both through and interchange railroad traffic to by-pass the central part of the Region. This line is mostly over new right-of-way, and primarily through open and undeveloped country encircling the Region at a distance of about 20 miles from the New York City Hall. A description of the route is as follows:

(1) Starting at the New York, New Haven & Hartford Railroad at a point near Greenwich, Connecticut, the route extends westerly, passing to the north of Port Chester, follows the Mamaroneck River valley and continues through White Plains to the Putnam Division of the New York Central Railroad at Elmsford. (Proceeding northwest from this point is a connection with the Hudson River Division of the New York Central Railroad at Tarrytown.) The main belt line continues from Elmsford southwesterly along the Putnam Division for about a mile, whence it goes westerly in a proposed tunnel under the hills between the Saw Mill River valley and the Hudson River, and under the Hudson River to connect with the Northern Railroad of New Jersey (Erie Railroad system) at Piermont. It follows this latter railroad to about the New York-New Jersey State Line, whence it continues over a new right-of-way in a southwesterly direction, passing through Westwood, Glen Rock and Hawthorne; thence on the outskirts of Paterson and along the Passaic River valley to Summit; thence via the Plainfields and Metuchen to Perth Amboy; thence through the westerly and northerly sections of the borough of Richmond (with a connection under the Kill van Kull to the Central Railroad of New Jersey in Bayonne) to the Narrows Tunnel and thence to and along the Bay Ridge Division of the Long

[1] These figures are taken from Regional Survey, Volume IV, pages 18, 82–96 and 113–128. [2] *Ibid.*, page 164.

Island Railroad to the point where it bends north in the vicinity of Linden Boulevard in the borough of Brooklyn. At this point the outer belt splits into an inner, or westerly, and outer, or easterly, branch (see 1–A). The westerly branch continues over the Long Island Railroad, the New York Connecting Railroad and the New York, New Haven & Hartford Railroad to the point of beginning at Greenwich.

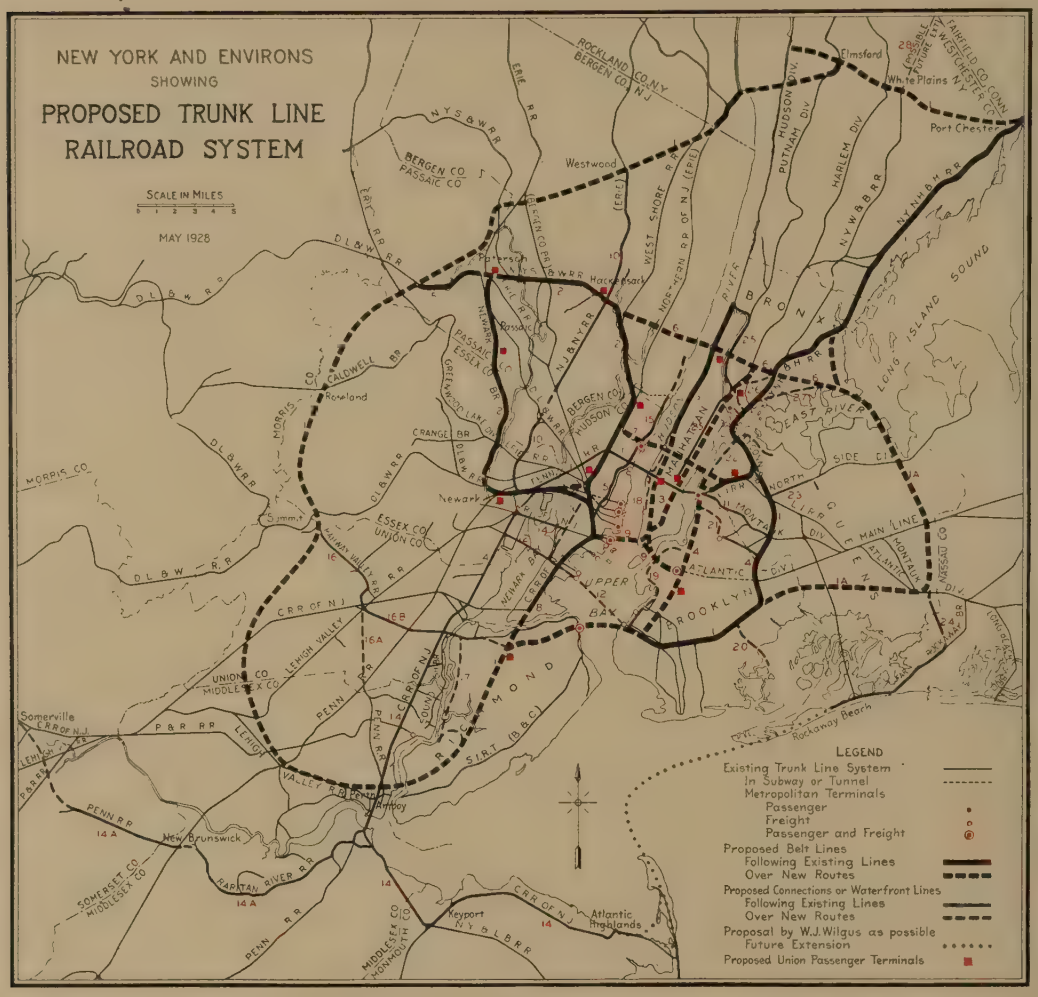


FIG. 3

(1-A) The easterly branch passes through the undeveloped portions of the boroughs of Queens and The Bronx along a new right-of-way which, beginning at the Bay Ridge Division of the Long Island Railroad, extends easterly on the south side of Fairfield Avenue and paralleling the northerly shore line of Jamaica Bay to near the easterly line of the borough of Queens; thence northerly along or parallel to Hook Creek Boulevard, 224th Street, Winchester Boulevard, Easthampton Road and Little

Neck Boulevard to about 26th Avenue; thence westerly and northerly, crossing under the East River from Cryders Point in Queens to Throgs Neck in The Bronx; and thence along the easterly bank of Westchester Creek to the Harlem River Branch of the New York, New Haven & Hartford Railroad at a point south of Bronx and Pelham Parkway, where it rejoins the westerly branch.

Connections are proposed between the belt line and all intersecting railroads. By means of the outer belt line the railroads of the Port would be brought in direct contact with every harbor and industrial development. Alien traffic now passing

Courtesy, Chief Engineer, Delaware, Lackawanna & Western Railroad

HACKENSACK RIVER BRIDGE OF THE DELAWARE, LACKAWANNA & WESTERN RAILROAD

The modern type of movable bridge being built over the secondary waterways of the Port. When closed, the clearance is 40 feet; when open, 135 feet. Construction was completed in 1928.

through the Region could be by-passed around the central area from one railroad to another. There would be numerous locations adjacent to the line where land is now relatively cheap and industrial areas could be developed with proper housing provisions, parks and open space for the employes. The absence of drawbridges, with their interference to both rail and water transportation, would eliminate delays to both types of traffic.

That part of the outer belt line, as described above, between Sparkill and Plainfield, corresponds approximately to the outer belt line of the Port of New York Authority's Comprehensive Plan. The section from the Narrows Tunnel, via the westerly branch, to a point on the New York, New Haven & Hartford Railroad

north of Port Morris, is the same as a part of the middle belt line of the Port Authority Plan.

Inner Belt Lines.—To facilitate distribution and an elasticity of routing there is proposed within the outer belt a system of three inter-connected inner belt lines. One of these is in New Jersey and two are within the limits of New York City. Included in the connections of this systen are three Hudson River crossings. The routes followed in each case are described below.

New Jersey Inner Belt

(2) Starting at Paterson, this route follows the New York, Susquehanna & Western Railroad to Hackensack and Bogota; thence along parts of the West Shore Railroad and Northern Railroad of New Jersey (Erie Railroad system) to a point in Jersey City back of Bergen Hill; thence by a new connection to the Pennsylvania Railroad and westerly via that railroad through Kearny to Harrison; thence over the Morris & Essex Division of the Delaware, Lackawanna & Western Railroad to Newark; thence by a new connection on the westerly side of the Passaic River to the Newark Branch of the Erie Railroad and along that railroad to Paterson; thence by a short new connection to the point of beginning on the New York, Susquehanna & Western Railroad. All of this route except a section in Jersey City and Kearny corresponds with the New Jersey belt line proposed as part of the suburban rapid transit system.

New York Inner Belts

(3) One of the New York inner belt lines is almost entirely within the borough of Manhattan, New York City. Starting at Spuyten Duyvil in The Bronx, on the Hudson River Division of the New York Central Railroad, it follows the New York Central freight line on the west side of Manhattan southerly to about 81st Street; thence on a new right-of-way under parts of Broadway, Eighth Avenue, Hudson Street, West Broadway and Washington Street to the Battery; thence crossing to the east side of Manhattan via Beaver Street and northerly under Pearl Street, the Bowery and Third Avenue; thence crossing into The Bronx and connecting with the Hudson River and Harlem Divisions of the New York Central Railroad, following the latter Division to the connecting belt line No. 6, described below. Most of the easterly portion of the belt and part of the westerly portion is along a route also included in the proposed suburban rapid transit system.

(4) The second New York inner belt line is within the boroughs of Brooklyn and Queens. Starting at a point on the outer belt line in the Bay Ridge section of Brooklyn, it follows Eighth Avenue and crosses under Greenwood Cemetery to Prospect Park Plaza; thence under Vanderbilt, Washington, Kent and Franklin Avenues; thence under Newtown Creek and connecting with the Main Line of the Long Island Railroad in Long Island City; thence along that railroad to the New York Connecting Railroad at Woodside; completing the belt via a section of the outer belt line over the New York Connecting Railroad and the Bay Ridge Division of the Long Island Railroad to the point of beginning.

Connecting Belt Lines.—Included in the proposed system of belt lines, there are several routes which furnish inter-communication by connecting the outer belt line, the New Jersey inner belt, and the New York inner belts. The routes which they follow are described below.

(5) From the New Jersey inner belt line at Paterson to the outer belt line at Totowa by means of a proposed connection between the former and the Boonton Branch of the Delaware, Lackawanna &

Western Railroad; thence via this railroad, meeting the outer belt line between Little Falls and Mountain View.

(6) From the New Jersey inner belt line at Bogota to the outer belt line in The Bronx over a new right-of-way, crossing on the Hudson River Bridge between Fort Lee and 178th Street in Manhattan (construction started in 1927); thence along or adjacent to 178th Street and crossing the Harlem River on a proposed new bridge; thence diagonally to East 170th Street and along that street and Jennings Street to a connection with the westerly branch of the outer belt line near the Bronx River; thence diagonally to a connection with the easterly branch of the outer belt line near Westchester Creek. This line also connects with the Manhattan-Bronx inner belt line at its intersection with the Harlem Division of the New York Central Railroad.

(7) From the New Jersey inner belt line at New Durham to the Brooklyn-Queens inner belt line at Long Island City by means of a proposed tunnel under Bergen Hill, the Hudson River, 57th Street in Manhattan, and the East River. At the Queens shore of the East River this line divides, one branch connecting with the Main Line of the Long Island Railroad at Sunnyside Yard and the other extending south to connect with the proposed waterfront route at a point north of Newtown Creek.

(8) From the New Jersey inner belt line in Jersey City to the outer belt line in the borough of Richmond, following the Lehigh Valley Railroad and the Central Railroad of New Jersey to about Tenth Street in Bayonne; thence via a new crossing of the Kill van Kull to the borough of Richmond, connecting with outer belt line in the vicinity of Forest Avenue.

(9) Connecting the preceding line with the Manhattan-Bronx inner belt line at the Battery and with the Brooklyn-Queens inner belt line near Atlantic Avenue in Brooklyn by means of a tunnel under the Hudson River, the tip of Manhattan and the East River, and along Atlantic Avenue in Brooklyn.

Connections or Waterfront Lines.—The purpose of these proposed lines, which connect with the belt lines, is to furnish adequate rail facilities to the numerous existing and proposed industrial areas and to those areas which now possess shipping facilities or for which shipping facilities are proposed. Some of these also follow existing railroad rights-of-way and others are along new routes. A brief description of each is given below.

(10) From Westwood in Bergen County along the New Jersey & New York Railroad (Erie Railroad system) southerly to East Rutherford, whence a new connection is proposed to the Delaware, Lackawanna & Western Railroad cut-off on the west side of the Hackensack meadows; thence along the route of that railroad, terminating at the New Jersey inner belt line in Kearny. The lower section of this line will serve the proposed industrial area in the Hackensack meadows on the westerly side of the Hackensack River.

(11) Between the New Jersey inner belt at Kearny and the outer belt line at Glendale in the borough of Queens, following the Main Lines of the Pennsylvania and Long Island Railroads easterly to Long Island City; thence along the Montauk Division of the Long Island Railroad to its intersection with the New York Connecting Railroad.

(12) Along the Pennsylvania Railroad freight line from its junction with the Central Railroad of New Jersey on the Newark meadows easterly to Bayonne; thence by an extension in tunnel under the Upper Bay to connect with the Bay Ridge Division of the Long Island Railroad (outer belt line) in Brooklyn. This route corresponds to a part of the middle belt line of the Port Authority's Compre-

hensive Plan, and furnishes a connection between the railroads on the New Jersey side and the Long Island Railroad system.

(13) Along a new right-of-way on the easterly side of the Hackensack River and Newark Bay, between the New Jersey inner belt line in Jersey City and the Lehigh Valley Railroad in Bayonne. The proposed industrial and port areas at Droyers Point in Jersey City would be served by this line.

(14) From the preceding route, at a point northeast of Droyers Point in Jersey City, along the Newark Branch of the Central Railroad of New Jersey to the northerly part of the Newark meadows (with a connection to the New Jersey inner belt in Kearny along the Pennsylvania Railroad freight line); thence along the Perth Amboy Branch of the Central Railroad of New Jersey through Elizabeth, Perth Amboy, South Amboy and Keyport to Atlantic Highlands. A branch of this route (14-A) swings westerly from South Amboy along the Raritan River Railroad to New Brunswick; over a new connection at that point to the Millstone Branch of the Pennsylvania Railroad and along that Branch to East Millstone; thence by a new connection to the Central Railroad of New Jersey at Somerville. The importance of this line is in that it will serve the existing and proposed industrial areas, and areas suitable for or already developed as port areas, of Port Newark, Elizabethport, Arthur Kill, Perth Amboy, Raritan River, Cheesequake Creek and Lorillard. It includes parts of the Port Authority's proposed middle belt line and belt line No. 11, and all of its belt line No. 10.

Courtesy, Port of New York Authority

VIEW ALONG CONNECTING BELT LINE NO. 15 IN HUDSON COUNTY

Looking north from about 15th Street, Jersey City. This was placed under unified operation in 1925 as a part of waterfront belt line No. 13 of the Port Authority Plan.

(15) Along the westerly shore of the Hudson River beginning at the Lehigh Valley Railroad in Jersey City and following northerly along the New Jersey Junction Railroad, the West Shore Railroad, the Erie Railroad and the New York, Susquehanna & Western Railroad to Edgewater; thence by a proposed extension to Fort Lee. All of this line forms a part of belt line No. 13 of the Port Authority Plan and the existing section was placed under unified operation in 1925. This line is important in that it serves the industrial area of Jersey City and the Hudson River piers and industrial areas of Hoboken, Weehawken, West New York and Edgewater.

(16) From the outer belt line at a point east of Summit along the Rahway Valley Railroad to Roselle Park, where the route forks; one section (16-A) continuing over a new right-of-way to a connection with the Pennsylvania Railroad in the southerly section of Rahway; and the other section (16-B) following the main freight line of the Baltimore & Ohio Railroad from Roselle to the borough

of Richmond, thence by a new connection to the outer belt line at a point south of Port Richmond. This route, as may be seen from Fig. 3, gives a short connection inside the outer belt line between Summit and the northerly section of the borough of Richmond.

(17) A line wholly in the borough of Richmond on the easterly shore of Arthur Kill, extending southerly from the preceding route to a point south of Fresh Kills and connecting with the outer belt line near Green Ridge. This line will serve the proposed industrial area and the area which is adaptable for port development on the New York City side of Arthur Kill.

(18) A freight line to serve the lower West Side of the borough of Manhattan. Branching off the New York inner belt (3) at about 81st Street this route continues south along the present New York Central Railroad right-of-way to the 60th Street Yards. From this point it is shown, along the route under negotiation in 1928 between the New York Central Railroad and the City of New York, south to the projected Spring Street Terminal. This project—which calls for depressed tracks from the 60th Street Yards to a new 30th Street Yard and a viaduct on a private right-of-way from the latter point to Spring Street—has been incorporated in the Regional Plan although it is felt that the extension south of 30th Street may not be economically justifiable. The 30th Street and Spring Street terminals are shown on Fig. 3 as existing freight terminals due to the advanced stage of the negotiations between the railroad company and the city. The construction of this route is a most important part of the program for eliminating railroad grade crossings in New York City.

(19) A line wholly in the westerly part of the borough of Brooklyn from the outer belt line at Bay Ridge northeasterly along the Bush Terminal Railroad; thence continuing along the waterfront to connect with the Brooklyn-Queens inner belt line in the vicinity of the Brooklyn Navy Yard. This waterfront line will serve industrial areas and such important developments as the Bush Terminal, State Barge Canal Terminal, Erie Basin, Atlantic Basin and Brooklyn Navy Yard. It corresponds to part of belt line No. 3 of the Port Authority Plan and was proposed by the Brooklyn Committee on City Plan in its plan presented in 1913.

(20) A line in the southern part of Brooklyn from the outer belt line at a point northwest of Canarsie along the westerly side of Paerdegat Basin and south to Mill Basin. This would serve existing and proposed port and industrial areas on the westerly side of Jamaica Bay. A route similar to this was proposed by the Brooklyn Committee on City Plan in 1913. It is an official proposal of the City of New York and is part of belt line No. 7 of the Port Authority Plan.

(21) Along the Evergreen Branch of the Long Island Railroad from the western branch of the outer belt line at Ridgewood (borough of Queens) to the head of Newtown Creek; thence by an extension on the southerly side of Newtown Creek to meet the Brooklyn-Queens inner belt in the Greenpoint section of Brooklyn. This line will serve the existing and proposed industrial areas on the southerly side of Newtown Creek. It was proposed by the Brooklyn Committee on City Plan and corresponds to belt line No. 6 of the Port Authority Plan.

(22) A line in the westerly part of the borough of Queens from a point in Long Island City on the connecting belt line already described (7) northerly along the East River waterfront and easterly along the waterfront of Bowery Bay. This line will serve existing and proposed industrial areas, and corresponds to belt line No. 3 of the Port Authority Plan.

(23) A line in the northerly part of the borough of Queens along the North Side Division of the Long Island Railroad from the New York Connecting Railroad (outer belt line) to Flushing Creek, with a proposed short extension southerly on the westerly side of Flushing Creek. This line will serve the proposed industrial areas along Flushing Creek, and corresponds to belt line No. 4 of the Port Authority Plan.

(24) A line in the southerly part of the borough of Queens along the Rockaway and Far Rockaway Branches of the Long Island Railroad from the Rockaway Beach terminus to Cedarhurst; thence via the Cedarhurst cut-off to the outer belt line near Rosedale. Colonel William J. Wilgus has suggested a connection between the Rockaway Beach terminus of the Long Island Railroad and Atlantic Highlands on the Central Railroad of New Jersey via a causeway across the Lower Bay (with a tunnel under a widened Ambrose Channel) between Rockaway Point and Sandy Hook. Though not included in the Regional Plan this proposal has been indicated on Fig. 3 as a possible future extension of this route and would carry the easterly branch of the outer belt line entirely outside the boroughs of Brooklyn and Richmond.

(25) Along the Main Line of the New York Central Railroad from Spuyten Duyvil to the Grand Central Terminal. This line will be the principal route by means of which passengers arriving from the north and east will reach the midtown section of Manhattan.

(26) Two connections in The Bronx between the Manhattan-Bronx inner belt line and the outer belt line. One of these is from the Harlem River Branch of the New York, New Haven & Hartford Railroad at Port Morris to the Main Line of the New York Central Railroad at Mott Haven; this corresponds to part of the middle belt line of the Port Authority Plan. The other is from the Harlem Division of the New York Central Railroad, at about 162d Street, along 165th Street and Westchester Avenue to the Harlem River Branch of the New York, New Haven & Hartford Railroad.

(27) A line in the southerly part of The Bronx between the westerly and easterly loops of the outer belt line, from the New York, New Haven & Hartford Railroad at Casanova to the proposed new route along Westchester Creek.

(28) An extension of the New York, Westchester & Boston Railroad from its White Plains terminal to Brewster and Danbury was proposed several years ago by the officials of that railroad. Such a route has been shown on Map No. 1 in the pocket at the back of this volume as a possible future extension.

Proposed Union Passenger Terminals.—On the New Jersey inner belt line there are six proposed union passenger terminals which are to be located in Paterson, Hackensack, North Bergen, Jersey City, Newark and at a point in Clifton southwest of Passaic.

In Manhattan there are three proposed union passenger terminals—the existing Grand Central and Pennsylvania Terminals and a new terminal in the neighborhood of 178th Street and Amsterdam Avenue on the outer belt line. Each of the other boroughs of New York City has a single proposed union passenger terminal; that in The Bronx is in the neighborhood of 149th Street and Mott Avenue on the Manhattan-Bronx inner belt line; that in Queens is near Queens Plaza and that in Brooklyn near Prospect Park Plaza, both being on the Brooklyn-Queens inner belt line; and that in the borough of Richmond is shown on the outer belt line at a point south of Port Richmond.

Through these stations and by means of the proposed belt lines it will be possible for trunk line railroad passengers to reach quickly and comfortably any community within the central and suburban parts of the Region.

Although shown on the maps as an existing freight terminal only, the site of the present 60th Street Yards of the New York Central Railroad may ultimately be

developed with advantage as a new passenger as well as freight terminal and connected with the suburban rapid transit system operating both north and south in Manhattan and east and west across the Island between Hackensack in New Jersey and Long Island City on Long Island.

Of the proposed system of 13 union passenger terminals, only two are located in the central business area south of 59th Street, Manhattan. These are the existing Grand Central and Pennsylvania Terminals which are now heavily overloaded with suburban traffic. The other 11 terminals will serve large and important areas. In most cases they will also be directly connected with the proposed suburban rapid transit system which is described on the following pages. Their development, combined with the establishment of a separate system for suburban rapid transit, will enable the present terminals in southern Manhattan to provide the increased facilities which that particular area requires for long distance transportation.

Motor Bus Sub-terminals.—The establishment by the Baltimore & Ohio Railroad, in 1926, of sub-terminals in Manhattan and Brooklyn connected with their rail passenger terminal in Jersey City by a fleet of motor buses is proving to be a significant development. It furnished a substitution for direct rail service to the Pennsylvania Station, which was terminated because of the increasing need of that terminal for the Pennsylvania Railroad and its subsidiary, the Long Island Railroad.

Motor bus sub-terminals were established on East 42d Street in Manhattan and on Joralemon Street in Brooklyn; several stops were made to pick up and drop passengers between these points and Jersey City. The motor bus terminals have been improved in equipment and convenience, the Manhattan terminal being moved into the new Chanin Building at East 42d Street and Lexington Avenue in 1929. Complete ticket, waiting room and baggage checking service is provided. No extra charge is made above that to and from the rail terminal.

This distributing system was designed and installed for the long-haul passenger only. It would not be suitable for commuter traffic, which is too much concentrated in rush-hour loads to be handled efficiently in this way.

So far as the New Jersey railroads are concerned, it is probable that additional sub-terminals of this type can advantageously be installed to give direct contact between the rail terminals and important points in Manhattan, Brooklyn and, perhaps, in Queens. It is probable also that such sub-terminals may prove to be permanently beneficial, in some form, even after the construction of the distributing loops proposed in the Regional Plan. In their present form they permit an immediate increase of transport facilities and have the public advantage of encouraging a certain amount of decentralization.

This method of transport has not yet gone beyond the experimental stage. But an elastic form of supplementary service of this type, considering the difficulties of increasing the size or number of main terminals, and considering also the prospective

demands of widely distributed airports, may have great possibilities. Even when compared with large central terminals in a fixed position, this system has great merits. It is an example of the proper co-ordination of different types of transportation service under a single operating agency.

Suburban Rapid Transit

Suburban rapid transit facilities, as distinguished from city rapid transit facilities provided on special tracks, have already been referred to as those which serve the commuters, who travel several times a week back and forth between their places of residence in the suburban parts of the Region and their places of work in the central business and commercial areas. The service is now furnished entirely by the trunk line railroads in trains operated over the same tracks as are used for other types of railroad business. It can also be distinguished from the city rapid transit service by the fact that it is run upon a time-table schedule rather than a time-interval schedule such as is used on the city lines, this time interval being so short that a passenger does not need to consult a time-table but can merely proceed to the station and board the next train.

Commuter traffic has been distinguished from other passenger traffic using the trunk railroad lines as that which travels upon a reduced-fare ticket, including monthly commutation, multiple-trip and school tickets. It is this commuter traffic that has been increasing at rapid rates and now presents so serious a problem for the railroads that it is generally admitted that special facilities for it must be created within the central part of the Region. These should be provided so as to permit the commuter to reach his destination with greater comfort and dispatch and at the same time release for local use the space on the city rapid transit trains now occupied by commuters in traveling between their places of work and the existing railroad terminals. If the special suburban rapid transit facilities proposed within the central areas are carried out to tap the railroad lines beyond these terminals the latter would be enabled to deal adequately with the needs of long distance travel, which was originally their primary function.

Existing Facilities and Passengers Transported

The existing commuter facilities and the trends in this type of traffic have been described in the regional survey,[1] but will be briefly summarized here.

There were, in 1924, over 27,000,000 commuters carried into and out of the Grand Central Terminal by the New York Central and the New York, New Haven & Hartford Railroads. This approximated 42,500 per day in each direction. The following railroad lines terminate in The Bronx: The Putnam Division of the New York Central

[1] Regional Survey, Volume IV, pages 58–63 and 74–86.

Railroad; the Harlem River Branch of the New York, New Haven & Hartford Railroad; and the New York, Westchester & Boston Railroad. In 1924 these carried about 2,420,000 commuters into and out of their terminals, or an equivalent of 3,800 commuters per day in each direction. In the case of the Putnam Division, the commuter traffic reached a peak in 1920 and since then has carried a daily commuter traffic of approximately 1,200 commuters to and from its terminal.

The New York, Westchester & Boston Railroad, the operations of which approach rapid transit service in character, has shown remarkable increases in its commuter traffic. While it carried about 1,663,000 commuters to and from its Bronx terminal in 1924, the 1928 figure was almost twice this and equivalent to about 5,100 commuters per day in each direction. Part of this increase has been due to a shifting of traffic from the Main Line of the New York, New Haven & Hartford Railroad, because of a substantial increase in rates upon the latter effective in August, 1924. Passenger traffic on the Harlem River Branch of the New York, New Haven & Hartford Railroad decreased steadily after 1918 and by 1928 was being handled almost entirely by the New York, Westchester & Boston Railroad.

The Long Island Railroad carried approximately 25,000,000 commuters to and from the Pennsylvania Station and about 15,300,000 commuters to and from its Atlantic Avenue and Long Island City terminals in 1924. These figures were equivalent to a one-way daily commuter traffic of 39,100 and 23,900, respectively, or a total of 63,000. The Long Island City terminal had become relatively unimportant as a commuter terminal. The seriousness of the problem of the Long Island Railroad may be realized from the fact that in 1924 there were about two-and-a-half times as many commuters to and from the Pennsylvania Station as total passengers carried by the Pennsylvania Railroad into the same terminal. The Atlantic Avenue Terminal has, for several years, been much congested. Of all the railroads entering the metropolitan district, the Long Island Railroad is confronted with the most acute problem in handling its commuting traffic.

The New Jersey railroads entering the Region from the west carried, in 1924, 92,053,000 commuters who were destined for New York City, or a daily one-way traffic of 144,000. The principal carriers were the Pennsylvania, the Erie and the Delaware, Lackawanna & Western Railroads, and the Central Railroad of New Jersey, which together transported almost 90 per cent of the total New Jersey commuter traffic. In the case of the New Jersey railroads, better means must be found for transporting the commuters across the Hudson River, as the facilities of the Hudson & Manhattan Railroad are seriously congested, commuters are discouraged from using the Pennsylvania Railroad to Pennsylvania Station, and the ferries do not provide a rapid or efficient method except for local passengers who require no other means of transportation. A great many of the commuters from New Jersey use three means of transportation—the railroad to reach the terminal, the ferry or tunnel to cross the

Hudson River, and a rapid transit, surface or bus line to reach their destination in New York City.

The following is a summary of the distribution and volume of commuter traffic to and from New York City in 1924:

Origin	Total in- and outbound	Average daily one-way	Percentage
From the north—			
To Grand Central Terminal and all Bronx terminals	29,647,000	46,300	18.2
From the east—			
To Long Island Terminals and Pennsylvania Station	40,300,000	63,000	24.9
From the west—			
To all Manhattan and New Jersey terminals of New Jersey railroads	92,053,000	144,000	56.9
Totals	162,000,000	253,300	100.0

Results to be Accomplished

In suggesting a plan for the transportation of commuters, it has been the aim to accomplish certain specific results. The commuters from New Jersey are subject to great inconvenience and delay after arriving at the railroad terminal. A great many of them are bound for New York City and, as has been pointed out, must use some additional means of transportation to arrive at their destinations. The ideal suburban rapid transit system should transport the commuter from his place of residence to within reasonable walking distance of his destination, or at least minimize the necessity for changing from one form of transportation to another.

The suburban transportation system should also furnish communication between the various suburban parts of the Region with the least possible inconvenience. This means that it should provide intercommunication between the transportation facilities in New Jersey, those on Long Island and those entering Manhattan from north of the Harlem River. When the volume of commuter traffic is sufficient, by-pass routes should be constructed so as to eliminate the necessity of traversing the most congested areas in order to reach destinations in other parts of the main and secondary centers.

On the existing systems the rush-hour load in one direction greatly exceeds that in the other, the volume of commuter traffic being heavy inbound in the morning and outbound in the evening, with very light traffic in the reverse directions. This means that a large number of the trains must be stored near the terminals or run back empty to a storage yard and return empty to the terminal in time to take care of the evening outbound traffic. Such a procedure is inefficient and expensive. If there were more intercommunication some equalization of the load would be obtained. For example, the morning rush-hour trains from New Jersey, carrying passengers to Manhattan, might continue on the proposed system to the railroads from the north or

from the east. On their return trip they could be utilized by some of the commuters from those railroads who are bound for the central part of the Region.

A large volume of the commuter traffic makes use of the New York City rapid transit system; in the case of the New Jersey passengers it amounts to 35 per cent. That this is unsatisfactory is apparent from the conclusion of the Westchester County Transit Commission to lay aside all plans for connecting with the New York City rapid transit system.

The limits of the probable future rapid transit area have been defined in the regional survey.[1] It was indicated that a considerable area in New Jersey should be served partly by extensions of the existing rapid transit system and partly by sections of the proposed suburban rapid transit system. As already explained, it was impracticable to show either the existing city rapid transit system or its proposed extensions on the Graphic Regional Plan. Such routes have, however, been indicated in Survey Volume IV. Extensions to both the Hudson & Manhattan Company lines and the New York City systems were proposed, the latter being planned so as to serve primarily Hudson County in New Jersey.[2]

Estimated Future Traffic

Commuter traffic to and from New York City was estimated in analyzing the transit and transportation problems.[3] The following is a summary of the estimates for the year 1935:

Origin	Total in- and outbound	Average daily one-way	Percentage
From the north—			
To Grand Central Terminal and all Bronx terminals	50,500,000	78,800	18.6
From the east—			
To Long Island Terminals and Pennsylvania Station	98,000,000	153,200	36.1
From the west—			
To all Manhattan and New Jersey terminals of New Jersey railroads	123,000,000	192,000	45.3
Totals	271,500,000	424,000	100.0

The estimated increase in total commuter traffic to New York City, between 1924 and 1935, is about 67 per cent, with a 70 per cent increase in the traffic from the north, a 143 per cent increase from the east, and a 34 per cent increase in the traffic from the west.

Proposed Plan

The proposed suburban rapid transit system has been developed with regard for its relationship to the other features of the Regional Plan, especially the existing and proposed trunk line railroad and city rapid transit systems. The locations of existing and future sub-centers, the proposed highway system, and the best utilization of land

[1] Regional Survey, Volume IV, pages 23–25 and 189–193. [2] *Ibid.*, Fig. 84, page 191. [3] *Ibid.*, pages 119–124.

have all had an important influence on the selection of routes. The proposals of public authorities and other agencies and individuals have all been given consideration and many of them are included in the plan presented herein.

In describing the proposed system it has been divided into a first step and an ultimate plan. The first of these is in general merely the co-ordination of proposals already made by agencies representing different parts of the Region. The entire system is planned to accomplish the results and provide for the estimated future traffic described on the preceding pages. Within the built-up sections of the City of New York the lines should be at such a depth that it will be possible to construct standard two-level rapid transit subways immediately above them.

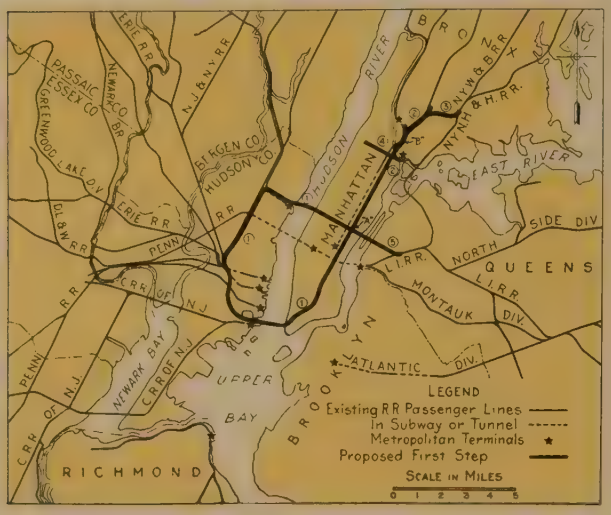


FIG. 4
PROPOSED FIRST STEP OF SUBURBAN RAPID TRANSIT SYSTEM

The complete system and its relation to the trunk line railroad system is shown on Map No. 1 in the pocket at the back of this volume. In many places both systems are shown along the same routes. In such cases there should be a separate operating system for the suburban rapid transit service. Where traffic is light, both suburban and trunk line trains might be operated over the same tracks; in other cases separate trackage should be provided for each type of service.

The First Step.—The first step of the proposed plan is shown in Fig. 4. It consists of a loop between Manhattan and New Jersey connected on the north with the New York Central, the New York, New Haven & Hartford, and the New York, Westchester & Boston Railroads and connected on the east with the Long Island Railroad in Queens. There is also included an extension of the New York, Westchester & Boston Railroad from its southerly terminus in The Bronx to and across Manhattan in the neighborhood of 125th Street. This extension could later be connected with a route on the west side of Manhattan included in the ultimate plan. The numbers on the map refer to the various routes as described below.

INTERSTATE LOOP

(1) The route of the interstate loop, starting for convenience of description at 57th Street and Third Avenue in Manhattan (marked "A" on Fig. 4), follows westerly across 57th Street under the

Hudson River and under the West Shore Railroad right-of-way through Bergen Hill, coming out at New Durham; thence southerly along the route of the Northern Railroad of New Jersey (Erie Railroad system), the Pennsylvania Railroad and the Lehigh Valley Railroad (Northern Docks Railroad); thence easterly along the route of the Central Railroad of New Jersey and under the Hudson River to Manhattan; thence northerly under Washington Street and easterly to Park Row; thence under Park Row, the Bowery and Third Avenue to the point of beginning at 57th Street. In general this loop corresponds with a proposal put forward by the North Jersey Transit Commission in 1925.

Northerly Connections

(2) A connection between the interstate loop and the railroads entering Manhattan through The Bronx is proposed via Third Avenue and a tunnel under the Harlem River. This route connects with the Main Line of the New York Central Railroad between the Harlem River and 149th Street (marked "B" on Fig. 4), affording access to the Hudson River, Putnam and Harlem Divisions of the New York Central Railroad and to the Main Line of the New York, New Haven & Hartford Railroad.

(3) Trains from the Harlem River Branch of the New York, New Haven & Hartford Railroad and the New York, Westchester & Boston Railroad could enter the proposed distribution system in Manhattan over a new connection from their right-of-way near its intersection with Westchester Avenue, via that avenue and 165th Street to Boston Road, and thence to the route of the Harlem Division of the New York Central Railroad at about 162d Street.

The connections under both (2) and (3) correspond with those proposed by the Westchester County Transit Commission in 1924, although they follow somewhat different routes.

(4) The extension of the New York, Westchester & Boston Railroad is proposed from its present Harlem River terminal in The Bronx under the Harlem River to 125th Street; thence westerly under 125th Street or an adjoining street to the vicinity of St. Nicholas Avenue.

Easterly Connection

(5) An easterly connection is proposed between the interstate loop, at 57th Street and Third Avenue, and the Long Island Railroad via 57th Street, under the East River to Queens and along Harris Avenue, connecting with the Long Island Railroad in the vicinity of Diagonal Street.

Ultimate Plan.—The ultimate plan is shown in Fig. 5, and is based on the electrification of most of the railroads handling commuter traffic or the substitution of additional trackage for electrical operation, either under, over or adjacent to the existing railroad rights-of-way. The system is extended into New Jersey to include the area within an approximately 20-mile radius of New York City Hall, and into Westchester and Nassau Counties to include the areas within about a 25-mile radius of the same point.

Several new routes are included to facilitate direct connections between different parts of the Region. There are also shown, by the broken lines in Fig. 5, certain portions of the proposed trunk line railroad system which should be particularly useful for suburban rapid transit purposes, although separate facilities for rapid transit traffic would not be justifiable along such routes. Other trunk line routes would also supplement the suburban transit system, as can be seen from a study of Pocket Map No. 1 at the back of this volume.

New Jersey System

That part of the system which is within the State of New Jersey includes a belt line connecting the municipalities of Jersey City, Newark, Paterson and Hackensack and all intervening communities. It also includes a system of radial and connecting routes leading to the interstate loop already described

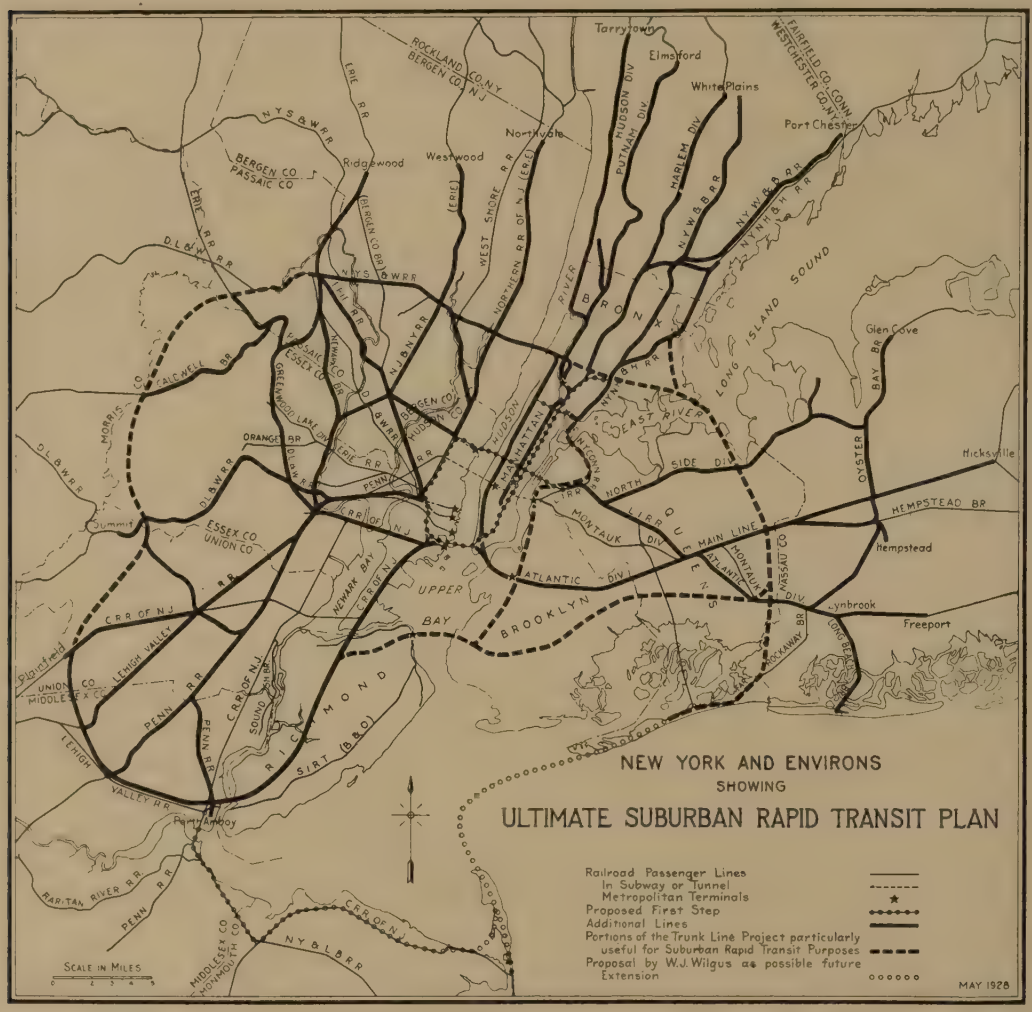


FIG. 5

as part of the first step and to a third Hudson River crossing which it is proposed should utilize the Hudson River Bridge (construction started in 1927) between Fort Lee and 178th Street in Manhattan.

All of these routes are briefly described below, and are grouped first under a heading of the "New Jersey Belt Line" and then under the various existing railroad systems parts of whose rights-of-way

are followed in the proposed suburban rapid transit system. This arrangement is purely for the convenience of description, as it is intended that all the suburban routes should form a single unified operating system. A few of the new connections which are not part of the belt line or closely related to any single existing railroad system are described under a heading of "Additional Connections."

New Jersey Belt Line.—Starting at the proposed Jersey City Terminal on the interstate loop this follows the route of the Morris & Essex Division of the Delaware, Lackawanna & Western Railroad to Newark; thence by a new connection on the westerly side of the Passaic River to the Newark Branch of the Erie Railroad; thence along the route of this Branch to Paterson; thence by a new connection to the New York, Susquehanna & Western Railroad; and thence along the route of that railroad and parts of the West Shore Railroad and Northern Railroad of New Jersey to the point of beginning. The last part of the route is identical with a portion of the interstate loop. All but a section in Jersey City and Kearny corresponds with the proposed New Jersey inner belt line of the trunk line railroad system.

Delaware, Lackawanna & Western Railroad.—From a point in Newark on the New Jersey belt line the Morris & Essex Division is followed to Summit. The entire Montclair Branch is also included, with an extension from its Montclair terminus to the Greenwood Lake Division of the Erie Railroad.

The Erie System.—The Northern Railroad of New Jersey is followed from its connection with the proposed New Jersey belt line in North Bergen Township to Northvale; the New York Division from the proposed terminal of the interstate loop to Ridgewood; the Greenwood Lake Division from the proposed connection with the Montclair Branch of the Delaware, Lackawanna & Western Railroad to Singac; the Caldwell Branch from Great Notch to the Passaic River; the New Jersey & New York Railroad from its junction with the New York Division to Westwood.

Pennsylvania Railroad.—From a point in Harrison on the New Jersey belt line the Main Line is followed to Metuchen; the Perth Amboy Branch from Rahway to Perth Amboy. A new connection is shown in the City of Newark along the Passaic River from the Main Line of the Pennsylvania Railroad northerly to the New Jersey belt line at the point where it swings north from the Delaware, Lackawanna & Western Railroad.

Lehigh Valley Railroad.—From its intersection with the Pennsylvania Main Line in the City of Newark the New York Division is followed to a point about a mile and a half east of South Plainfield.

Central Railroad of New Jersey.—The Main Line is followed southwesterly from its intersection with the Lehigh Valley Railroad at Aldene to Plainfield; also that part of the Main Line from a point on the interstate loop in Jersey City to about Tenth Street in Bayonne; the Newark Branch from its intersection with the Main Line in Jersey City to an intersection with the Main Line of the Pennsylvania Railroad in Newark. From the last named point a new connection is shown, following in part the approximate line of the abandoned Morris Canal, to the Montclair Branch of the Delaware, Lackawanna & Western Railroad. An extension is proposed from the southerly part of Bayonne across the Kill van Kull to the borough of Richmond, New York City, through the westerly part of that borough and across Arthur Kill to Perth Amboy.

Baltimore & Ohio Railroad.—The main freight line is followed from a connection with the Main Line of the Pennsylvania Railroad at Linden Junction to near Aldene; thence a connection is proposed to the Rahway Valley Railroad which is followed to a point east of Summit; from that point the route of the proposed outer belt of the trunk line railroad system is followed northerly to an intersection with the Morris & Essex Division of the Delaware, Lackawanna & Western Railroad.

Additional Connections.—A circumferential route is proposed through parts of Union and Middlesex Counties from the Main Line of the Central Railroad of New Jersey near Fanwood, connecting with the terminus of the route proposed along the Lehigh Valley Railroad, intersecting the Pennsylvania Rail-

road at Metuchen, thence going parallel to the Perth Amboy Branch of the Lehigh Valley Railroad and connecting at Perth Amboy with the proposed route across the borough of Richmond. From the proposed New Jersey belt line in Bogota a connection is shown southeasterly through Teaneck, Leonia and Fort Lee to the Hudson River Bridge and via that bridge to Manhattan and other parts of New York City. Both these routes follow parts of the proposed trunk line railroad system.

A new connection is proposed between the Greenwood Lake Branch of the Erie Railroad, at a point south of Montclair Heights, and the Newark Branch of the Erie Railroad at a point north of Athenia.

Another new connection is proposed from the proposed interstate belt line at New Durham extending westerly to a point at about the junction of the New York Division of the Erie Railroad and the New Jersey & New York Railroad, thence extending southwesterly and connecting with the proposed route along the Newark Branch of the Erie Railroad at a point in Belleville.

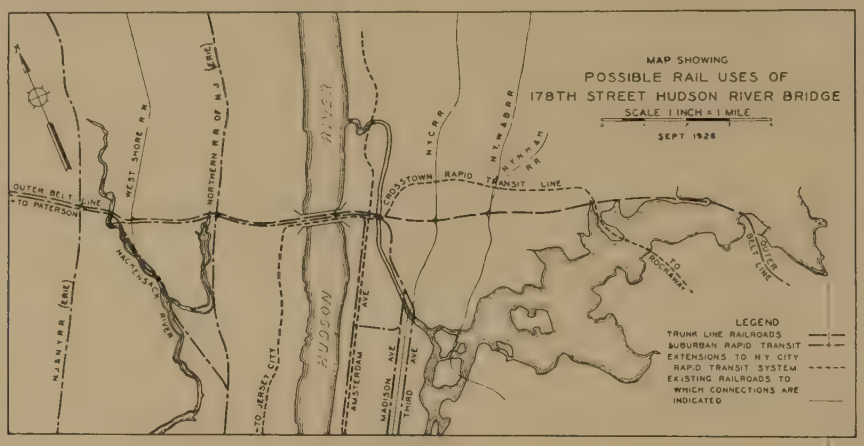


FIG. 6

A possible future extension of the New Jersey suburban rapid transit system has been shown from Perth Amboy via the New York & Long Branch Railroad to Matawan; thence via the Central Railroad of New Jersey to Atlantic Highlands; crossing thence to Sandy Hook and via the causeway (going under a widened Ambrose Channel in tunnel) which Colonel William J. Wilgus has suggested between Sandy Hook and Rockaway Point in the borough of Queens; connecting in that vicinity with the Long Island Railroad system.

The Long Island System

The ultimate plan would include routes along the following sections of the Long Island Railroad system:

Main Line.—The principal route would form a connection with the proposed central distributing system near Diagonal Street in Long Island City and Hicksville in Nassau County, including the Branches from Floral Park to Garden City and Hempstead, from Mineola to Valley Stream, and from Mineola (Oyster Bay Branch) to Glen Cove.

North Side Division.—The second route would extend from an intersection with the Main Line at Winfield to Port Washington, and make connection from Manhasset to the Oyster Bay Branch at Roslyn.

Atlantic Division.—The third route would start from the Flatbush Avenue Station in Brooklyn and extend to the intersection with the Montauk Division near Rosedale. A proposed addition to the central distributing system suggested in the first step is shown westerly and northerly from the Flatbush Avenue Station under the East River to the lines in Manhattan.

Montauk Division.—The fourth route would extend from an intersection with the Atlantic Division near Rosedale to Freeport, including the Long Beach Branch from Lynbrook to Long Beach.

The Bronx and Westchester System

With two small exceptions, the additional proposed routes in The Bronx and in Westchester County all follow the existing railroad lines, as follows:

New York Central Railroad.—The Hudson River Division from its connection with the first step to Tarrytown; the Putnam Division from its intersection with the Hudson River Division near the upper end of the Harlem River to Elmsford, including the Yonkers Branch; the Harlem Division from its connection with the first step to White Plains.

New York, New Haven & Hartford Railroad.—The Harlem River Branch from its New York City terminus to New Rochelle; the New York Division from its intersection with the Harlem Division of the New York Central Railroad at Woodlawn to New Rochelle.

New York, Westchester & Boston Railroad.—From its intersection with the Harlem River Branch of the New York, New Haven & Hartford Railroad in The Bronx to White Plains and to Port Chester (including an extension from its 1928 terminus at Rye to Port Chester as planned by the railroad company).

New Connections.—A new route is shown from the Hudson River Division of the New York Central Railroad near 162d Street in The Bronx, via University Avenue, Merriam Avenue and a new bridge across the Harlem River, to Manhattan, from whence it extends to New Jersey over the Hudson River Bridge. From the vicinity of Mott Haven a new connection is shown from the Main Line under the Harlem River to Manhattan, continuing south in that borough as part of the new distributing system described below.

Distributing System in Manhattan

The ultimate plan includes two additional north and south routes and other connections in Manhattan as follows:

West Side Route.—The first would start from a connection with the Hudson River Bridge at 178th Street south along Amsterdam Avenue, Broadway, Eighth Avenue, Hudson Street and West Broadway, connecting with the interstate loop in Washington Street.

East Side Route.—The second would go through the additional tunnel from The Bronx under the Harlem River described above, and extend south along Madison Avenue and an extension of that avenue to Broadway near 17th Street; thence easterly along 17th Street to a connection with the Third Avenue route shown as part of the first step.

Other Connections.—Connections are shown between the west side and east side routes and the extension of the New York, Westchester & Boston Railroad across 125th Street or an adjoining street as proposed in the first step. A new connecting route is shown from the interstate loop in the southern extremity of Manhattan southeast under the East River to the proposed extension of the Atlantic Avenue Division of the Long Island Railroad described above.

Through the utilization of the 178th Street Hudson River Bridge and the proposed new crossing of the Harlem River already mentioned in describing the Bronx system, the Washington Heights section of Manhattan would have direct suburban rapid transit connections with both New Jersey and Westchester County.

FIG. 7

PROPOSED RAIL CONNECTIONS AT THE NEW YORK END OF THE HUDSON RIVER BRIDGE

At a hearing before the Port of New York Authority on December 12, 1923, the Regional Plan Committee advocated a bridge at 178th Street as more desirable than the one suggested at 57th Street. Colonel William J. Wilgus recommended in September, 1926, that "provision should be made for not less than four and preferably six or even eight tracks, all capable of carrying standard railway electric equipment of the heaviest type." The Committee has advocated, from the start, the provision for rail facilities as part of the project. While the desirability of this was questioned the final design by the Port Authority permits four to eight tracks to be placed on the lower deck.

The above drawing indicates how a total of six tracks might form parts of the trunk line railroad, suburban rapid transit and local rapid transit systems. The locations of the trunk line facilities are shown in orange and those for suburban rapid transit, in green. (On the profile the orange line across and west of the Harlem River also represents the grade of the suburban rapid transit tracks.) A description of the proposed local rapid transit connections is not included in this volume but has been given in Survey Volume IV.

Operation

Three of the union passenger terminals which have been proposed in connection with the trunk line railroad system (see Fig. 3, page 184) are located on the routes included in the first step of the suburban rapid transit system. These are the Meadows Transfer Terminal in Jersey City, as proposed by the North Jersey Transit Commission; one in the borough of The Bronx in the neighborhood of 149th Street, connected with the railroads from the north; and one in Long Island City, borough of Queens, in the neighborhood of Diagonal Street, connected with the Long Island Railroad.

Pending the electrification of the New Jersey railroads it would be necessary for the commuters from that part of the Region to transfer at the proposed Jersey City Terminal to electric trains which would be operated through the new distributing system. As the railroads entering New York City from the north and east are already electrified, it should be possible from the start to operate their trains through the proposed distributing system. It is expected, however, that important sub-centers will spring up in the vicinity of the proposed Bronx and Long Island City terminals. They should therefore become destination points for a considerable number of commuters entering from the north and east. They would also be important transfer points for such passengers as were destined for points on the New York City rapid transit system outside of the central business area or not conveniently reached by the suburban rapid transit routes.

One of the main advantages to be obtained from the interstate loop in Manhattan and New Jersey and its proposed connections would be the great flexibility it would offer in methods of operation. It would permit the direct operation of trains from any one of the three outlying sectors to any other one. It would also permit, if desired, a loop operation from a single sector through the central business area and back into the same sector. The existing railroad terminals would be freed from the necessity of handling most of their present commuter business and would thus be able to serve adequately for many years the more profitable long-haul railroad traffic which they are better equipped to serve.

As such a large percentage of the routes proposed follow the lines of the trunk line railroads, which are now providing the only service available to the commuters, it is obvious that any system of operation must be worked out with the aid of the railroad companies. It is also essential that there should be co-operation between the municipalities and all public agencies on the one hand and the railroad companies on the other hand.

No attempt is made here to specify what type of operating agency should be created. It must be one that will permit unified operation over the entire system and the charging of a fare that will be sufficient to pay all operating and carrying charges.

Justification of System

The First Step.—As the proposed first step, shown in Fig. 4 (page 196), calls for a large amount of costly new construction it should be undertaken only if and when there is sufficient potential traffic to justify it. Estimates of commuter traffic to and from New York City in 1935 have been presented on page 195. These furnish a basis for computing the traffic that might be carried over the new central distributing system at that time, which would be about the earliest date at which it could be made available.

About 30 route miles are included in the first step of the suburban rapid transit system. If a reasonable density of traffic in passengers per track mile is determined, a comparison between such a figure and the average density of expected traffic spread over the 30 route miles of the distributing system would indicate the number of tracks that would be justified. For example, if the passengers per route mile are only twice a reasonable density of passengers per track mile a two-track system would suffice, if about four times the standard, a four-track system would be justified.

The numbers of passengers per track mile on the New York City rapid transit system from 1900 to 1925 have been shown graphically in a survey volume.[1] For the entire city this figure had increased during that period from about 1,200,000 to 3,000,000 with an average of about 2,500,000 passengers per track mile. It is not desirable that a suburban rapid transit system should ever approach the crowded conditions existing in 1925 on the New York City rapid transit lines. With a longer haul and a higher fare more comfortable service must be provided. A traffic density of from 1,500,000 to 2,000,000 passengers per track mile would therefore seem to be reasonable for a suburban rapid transit system.

It is impossible to state definitely what part of the commuter traffic to New York City would utilize the new distributing system in reaching its destination. Some of the commuters will undoubtedly continue to use existing rail terminals or will transfer to rapid transit facilities (including the Hudson & Manhattan Company lines) at the edges of the central business area. Many of the New Jersey commuters with offices within walking distance of the railroad ferries might continue to patronize such routes. On the other hand many railroad passengers who would not come under the classification of commuters would undoubtedly use the new distributing system.

Counts made by the North Jersey Transit Commission in 1924 indicated that 52.4 per cent of all New Jersey railroad passengers entering Manhattan walked to their destinations after reaching their rail or ferry terminals on the island; the remainder utilized a New York City transit facility to complete their journey. In addition to such railroad passengers the Hudson & Manhattan Company lines carried to Manhattan during 1924 over 75,000,000 passengers (about 70 per cent of their total traffic) who made no use of New Jersey railroad facilities and many of whom might utilize the proposed new distributing system.

[1] Regional Survey, Volume IV, Fig. 19 (page 42).

Similar counts made on a typical day in 1927 for passengers entering from the north and east gave the following results: Of the New York Central Railroad passengers arriving at Grand Central Terminal about 44 per cent walked to their destinations, the balance using some other means of transportation after leaving the terminal; in the case of the New York, New Haven & Hartford Railroad passengers, about 38 per cent walked; about 30 per cent of the Long Island Railroad passengers

Photo by Hamilton Maxwell, Inc

AIRPLANE VIEW OF MANHATTAN, SHOWING THE PROPOSED FIRST STEP IN THE SUBURBAN RAPID TRANSIT SYSTEM

The two lines at the left of the picture would be joined together in New Jersey, forming an interstate loop. The line running the length of Manhattan would give access to the areas already intensively developed and, at the same time, encourage a dispersal of such development over comparatively unused areas on the east side.

arriving at Pennsylvania Station walked to destinations from this terminal, and at the Atlantic Avenue Station in Brooklyn about 12 per cent walked.

From the above figures for passengers who now walk it would be conservative to assume that 50 per cent of the commuters entering New York City metropolitan terminals from all directions and the same percentage of the other-than-railroad traffic of the Hudson & Manhattan Company would use an independent suburban distributing system. On this basis the 1924 traffic over such a system, had it been in existence at that date, would have been about 118,000,000 passengers. This would have represented a density per route mile over the proposed first step of 3,900,000

passengers, or a track mile density of 1,950,000 passengers on a two-track system. This would indicate that a two-track system corresponding to the proposed first step would have been justified as early as 1924.

Applying the same method of calculation to figures for 1935 traffic the following results are obtained:

Estimated total railroad commuters to New York City metropolitan terminals	271,500,000
Estimated Hudson & Manhattan other-than-railroad passengers (70 per cent of total)	91,000,000
Total	362,500,000
Traffic over first step of suburban rapid transit system assumed as 50 per cent of above total	181,250,000
Passengers per route mile	6,040,000
Passengers per track mile on a two-track system	3,020,000
Passengers per track mile on a four-track system	1,510,000

The above figures indicate that even on this conservative basis a two-track system would be insufficient in 1935 and that a four-track system would be justified if congestion is to be avoided and some allowance made for expansion.

Ultimate Plan.—When it is realized that the railroad commuter traffic to and from all metropolitan terminals increased during the ten-year period ending with 1924 at an average rate of 7.5 per cent a year, it is obvious that large increases must be provided for. For the various sectors such figures varied from 14.2 per cent per year on the Long Island Railroad system to 5.0 per cent per year on the railroads entering from New Jersey. It is not expected that such rates will continue, but on the other hand there is nothing to indicate that the curves of growth will show a sudden downward break. The regional survey estimates indicated a possible total railroad traffic to and from areas served by the existing metropolitan terminals of 1,180,000,000 passengers in 1965, of whom about 910,000,000 would be included in commuter traffic.[1]

In addition to the traffic included in the above figures it is expected that a suburban rapid transit system would carry an increasing proportion of traffic confined to the various suburban sectors of the Region or between such sectors. The creation of new sub-centers or satellite communities and a decentralization of certain types of industry and business is not likely to be carried out to an extent that will lessen the demand for suburban transit, even if they result in eliminating much "commuter" travel and congestion of the transit lines.

Mr. Francis Lee Stuart[2] in a paper before the American Society of Civil Engineers[3] proposed a comprehensive suburban transit system for the New York metropolitan district. He stated that it would take from five to eight years to accomplish the benefits sought and that—

"The system by the time it could be completed would probably be carrying 700,000,000 passengers yearly and the charges might add 10 to 15 cents to each railroad fare to or from Manhattan, depending on the amount of benefit assessment levied."

[1] Regional Survey, Volume IV, page 124.

[2] Consulting Engineer, New York, N. Y.

[3] "Modernizing the Suburban Transit of the Metropolitan District," *Proceedings, American Society of Civil Engineers*, May, 1928, pages 1391–93.

This traffic figure was stated to be the average of several independent estimates and can therefore be accepted as reasonable.

Of the routes shown in the ultimate suburban rapid transit plan, a very small percentage will require new rights-of-way. Along those routes which follow existing railroad rights-of-way it is proposed to utilize the existing facilities where possible, otherwise to add additional tracks under, over or alongside of them. In some cases the present rights-of-way may have to be widened.

To sum up, it is held that the ultimate plan proposed will be justified to meet the needs of the potential traffic. The studies of the Regional Plan staff and of many authorities lead to the conclusion that the construction of a system of transit lines as here proposed would be warranted and would bring about the following results to the benefit of the entire Region:

First—The existing metropolitan railroad terminals would be greatly relieved of their present congestion.

Second—Large amounts of waterfront, particularly in New Jersey, would be released for shipping purposes.

Third—The commuter would travel in more comfort and in a shorter period of time and would be brought nearer to his destination.

Fourth—The rapid transit systems of New York City would be relieved of handling most of the commuter traffic, resulting in increased capacity for local riders.

The Waterway System

The New York region has, and is always likely to have, a superabundant system of natural waterways. With proper planning and with reasonable restriction of overcrowded development on its land areas it need never suffer from lack of facilities for communication by water. In this connection, its problem is to develop its land areas and its communications so as to make the maximum use of its rich abundance in water areas. Its waterways are not only more than ample, but so widely varied in their adaptability for different navigable and commercial uses and so widely distributed as to present an almost perfect natural arrangement.

Much has had to be done in the past in artificially improving the harbor and port by the building of piers, the deepening of channels, the reclamation of waterfront lands, and the development of the present railroad and harbor terminals. Opportunities for further improvements lie in the same directions and should make possible the establishment of a more unified system of terminals. These opportunities can be taken advantage of to the full extent that commerce demands or finance permits—for nature offers no restrictions on possible expansion.

Limited Scope of Harbor Proposals

The proposals in the Regional Plan for the improvement of port facilities for the handling of shipping are limited to those things that have to do with the land and terminal facilities that abut on the waterways. Such improvements involve of course the deepening of further channels for navigation. The waterways are under the control of the federal government through the War Department, which has adopted plans for deepening all the major and many of the minor waterways in the Region. These channels have already been described in the regional survey[1] and it is unnecessary to define them on the Plan or describe them in this report. Their position will be evident to those who study the proposals shown on the Graphic Plan for land reclamation and port development.

These government projects are tied in with, or supplemented by, many schemes for the detailed commercial development of waterfront property proposed or adopted over a period of many years by the City of New York, other municipalities in the Region, the Port of New York Authority and the State of New Jersey. The inclusion of many such projects in the Regional Plan is implied by the proposed waterfront industrial areas that are shown. They are therefore classified as a type of land use rather than as ways of communication and will be dealt with in more detail in that section of this report which is devoted to land uses.[2] The amount and distribution of such areas is based on an analysis, included in the regional survey, of port and industrial requirements and the relative advantages of the various potential sites.[3]

The Regional Plan does not contain any entirely novel proposal for extension of waterway improvements. In considering what features to include in a comprehensive outline plan it has not been necessary to do so, as proposals already made go beyond rather than fall short of prospective needs. Indeed one of the characteristics of the plan is that it tapers down, to what are considered to be reasonable limits, some of the proposals made for parts of the waterfront. These piecemeal proposals for sections of the waterfront, while not seeming to be too visionary when considered as separate schemes, are seen to be unnecessarily ambitious and therefore extravagant when they are studied as part of a comprehensive plan.

One of the basic assumptions underlying the preparation of the Plan is that the development of the Port of New York is of major importance in connection with living conditions, industry and transportation. There is ample room in the Upper Bay, Hudson River and East River for the main purposes of the Port for many decades. Therefore, the development of harbors in Jamaica Bay and Newark Bay and the means of transportation, by rail and road, should be designed in such a way as to make the most of the existing Port, although in such a manner as not to preclude the extension of major harbor facilities to parts of Jamaica and Newark Bays in the future.

[1] See Regional Survey, Volume IV, page 104. [2] See pages 322–329 and 392–394. [3] See Regional Survey, Volume IV, Part II.

Improvements in Developed Areas

There are a number of improvements to areas already devoted to port development which are desirable but which could not be shown in detail on the map. Their need will be indicated in the statement of principles in Plan Volume II, but a few of the more important are listed here:

(1) Planning of the land areas abutting the Staten Island piers along the Narrows, so as to improve their approaches and provide for their more efficient utilization;

(2) Provision of more 1,000-foot piers on the Hudson River waterfront of Manhattan so as to accommodate the largest sea-going vessels;

(3) Rebuilding, along modern lines, many of the antiquated dock facilities along the East River waterfront of Manhattan; it is believed that in many parts of this waterfront a quay wall development near the present pierhead lines would permit the most efficient use of the land areas;

(4) A two-level development of the Brooklyn East River waterfront between Atlantic Avenue and the Brooklyn Bridge; commercial activities to be concentrated on the lower level.

Ship Canals

The waterway proposals specifically shown on the Graphic Plan are limited to outstanding projects for ship canals, either over new routes or involving river straightenings.

New Jersey Ship Canal.—The ship canal between Raritan Bay and the Delaware River has been sponsored by the State of New Jersey to form part of the intracoastal canal projected by the United States Government along the Atlantic Coast. Reports have been made on this project by the War Department, and the State of New Jersey has spent considerable sums in surveying and monumenting a route for the canal and taken steps to acquire the necessary right-of-way. State legislation in New Jersey has contemplated that the state would acquire and cede to the federal government the necessary right-of-way when the federal authorities had approved the location and expressed by a sufficient appropriation its decision to build the canal. At the end of 1928 such action had not been taken. The incorporation of this project in the Regional Plan led to the inclusion of considerable proposed industrial areas in Middlesex County.

The New Jersey activities on this project are concentrated in the Board of Commerce and Navigation, which has devoted much time and study to the engineering phases of the project. The route proposed would be 33.7 miles in length and would reduce the distance by water from New York to Philadelphia from 274 miles to 87 miles. Through the recently enlarged Delaware & Chesapeake Canal, which furnishes the sea level link of the intracoastal canal across the State of Delaware, a protected waterway would also be furnished to the Port of Baltimore.

It is expected that construction of this ship canal would lead to the abandonment of the old Delaware & Raritan Canal which follows the Raritan and Millstone Rivers within the Region and reaches the Delaware River at Trenton.

The northerly terminus of the canal would be at the mouth of Cheesequake Creek on Raritan Bay, about two miles south of South Amboy. The proposed route crosses from the head of Cheesequake Creek to South River at Old Bridge; thence it follows along this river to a point north of Jamesburg; thence it swings westerly and southwesterly to leave the Region at the southern boundary of Cranberry Township. The proposed Delaware River terminus of the canal is at Bordentown, about five miles below the City of Trenton.

Hackensack River Straightening.—One of the major improvements included in the Regional Plan is a development of the large meadow areas in the lower Hackensack River valley. In connection with this, a straightening of the lower reaches of this river has been proposed, both to furnish a waterway to serve proposed industrial developments and to furnish the fill necessary to reclaim the adjoining parts of the meadows. It is intended that this waterway would be used mainly by traffic which could be adapted to pass under bridges with a 35- or 40-foot clearance and that masted shipping would be concentrated mostly at points farther south, such as Newark Bay, where it could enter without serious obstruction to the overland movement between metropolitan New Jersey and the City of New York.

The proposed straightening of the Hackensack River is closely connected with proposals for land uses in that vicinity and is further discussed in connection with such proposals.[1]

Raritan River Straightening.—A slight straightening of the Raritan River between New Brunswick and South Amboy has been indicated in the Plan. This was proposed in an industrial survey of the Raritan district prepared for the Port Raritan Survey Commission.[2] It would facilitate a suitable type of adjoining land development and the passage of shipping through the industrial areas proposed at that point. The waterway approach to New Brunswick, which is at the head of navigation on the Raritan River, would be improved.

The Regional Highway System

Highways, including roads and streets, are the most widely used and the most adaptable to change of the various types of ways of communication by land. They serve a greater variety of human needs and enter more intimately into the social and political structure of communities than railroads or transit lines. Whether built by state, county or municipal authorities—or by private owners—they are more or less public ways and they serve many needs in addition to those connected with circula-

[1] See illustration on page 323 and discussion of plan of Hackensack meadows in Plan Volume II.

[2] Industrial Survey and Report of the Raritan District, made to the Port Raritan Survey Commission by Charles W. Staniford, October 1, 1925.

tion of traffic. They are necessary to give the access to property for all purposes connected with its protection and social uses. In regard to traffic alone, they provide facilities for the pedestrian as well as for the vehicle; and for the fixed-rail as well as for the free-wheel vehicle.

Before the coming of railroads the highways were used for all forms of communication on land, but after railways were built and especially during the latter part of the 19th century they had drifted into a position of secondary importance

Photo by Fairchild Aerial Surveys, Inc.

NARROWS CROSSING

Either a bridge or tunnel in the neighborhood of the location indicated constitutes a major feature in the regional highway system. Preliminary studies for a vehicular tunnel between Brooklyn and Staten Island were authorized by the City of New York in March, 1929.

except for local domestic needs. In recent years the automobile has restored the predominance of the highway for the most flexible forms of transportation. The demands of mechanically propelled vehicles have grown so rapidly and so greatly that it has been an almost impossible task for the authorities to keep up with the growing needs for extended highway facilities. In spite of unprecedented expenditures on new roads and improvement of old roads, congestion of highway facilities has become a widely spread evil. The comprehensive planning of these facilities over wide regions is necessary to secure a satisfactory remedy.

The General Problem

In making the Regional Plan of New York the main aspects of the problem have been taken to be the following:

(a) Highways having resumed their former place as a major element in transportation, the main highway system must be planned comprehensively with due regard to its primary importance as a means of communication.

(b) A good highway system cannot be developed solely or mainly by the process of expanding now here, now there, some bit of a street system that was laid out to accommodate short hauls by horse drawn vehicles.

(c) The principal regional need is the development of wide radial or arterial highways with adequate connecting roads in order to provide facilities for greater freedom of movement, for a rational degree of dispersal, and for close contiguity of industry and residence.

(d) Although new types of highways, as well as widening of existing highways, are being constructed on a large scale at enormous expenditure, there is need for more varied and improved types. It is essential to provide more extensively than at present for the separation of grades at important junctions in the interest of safety and to avoid traffic delays. It is desirable also to promote the planning of more highways or parkways that will permit of partial segregation of different kinds of vehicles.

(e) There should be combined with the arterial highways bridle, cycling and walking paths, as well as recreation areas near to the highways in the manner which is being followed in the development of the Westchester County park and parkway system.

(f) The highway system should be developed on lines that will promote the best economic use of land abutting upon it and thereby create new values in land and buildings as a result of the expenditures on highway improvements. The creation of these new values, while giving a desirable benefit to owners of property, is mainly necessary to enable public authorities to recoup themselves indirectly for part of the cost of the improvements by an increase of tax revenues.

(g) The arterial highway system should be co-ordinated with the means of communication by rail. This is necessary in the interests of both highway and railroad communications. It is reasonable to assume that new developments in connection with road transportation, together with aerial transportation and new power development, will facilitate the wider distribution of population and industry. The railroad, by reason of its dependence on large units and large terminals, and of a growing tendency towards classification of trainloads of freight, have made a certain amount of congestion inevitable. Although ships and railroads will continue to carry great bulks for long distances, the motor truck and other vehicles that use the highway will introduce smaller and more elastic units for travel and distribution, thereby making excessive concentration less and less desirable.

(h) All these needs that have been referred to must be met together to achieve an economically sound development as well as a solution of the traffic problem. It is no more true today than it has ever been that one type of traffic can be adequately provided for without regard to all other types; or that new roads can be made to meet all the needs of vehicular traffic without some part of the cost being met by the creation of land values on abutting areas of land. Hundreds of miles of new highway are being built that not only fail to improve the uses and values of the areas through which they pass, but actually injure them; and the failure of these highways to provide for other needs than motor traffic means that they are more costly and less efficient than they need be for the purpose for which they are made.

(i) The highway system has the widest ramifications and the most rapid growth of any of the ways of communication. It is the most flexible in that it can be altered (especially in locations outside of the built-up areas) and extended, as a rule, in face of obstacles caused by geography and topography, more easily than trunk line railroads or transit lines. The one type of facility that can be more cheaply provided for rail than for highway purposes is the underwater crossing of the major waterways, as a tunnel designed for free-wheel motor vehicles must have an elaborate ventilating system, not needed in a railroad tunnel, and also more expensive approaches.

(j) Studies of traffic conditions and trends of growth have shown that the present system of highways will have to be greatly extended and improved to meet the prospective needs of land development. The provision of many new arteries and of an intervening street system will be necessary to provide convenient access to new areas likely to undergo development. It is inevitable that many hundreds of miles of new streets will have to be constructed within the New York region as it continues to grow. Great economies can be obtained in the construction of such a system by means of the making and adoption of a comprehensive plan.

Pattern of Proposed System

The Graphic Plan has been prepared with due regard to the foregoing factors and assumptions. Based on these assumptions the Plan contains an outline of a comprehensive system of highways and streets that will meet the demands for vehicular traffic to and from the different centers and sub-centers of the Region. This has required the inclusion in the Plan of a considerable network of traffic routes to serve all the existing or expected centers of industry, business, residence and recreation.

Estimates of future needs of space for traffic and a comparison between this and the existing facilities have been presented in the regional survey.[1] The proposed regional highway system has been designed to relieve existing congestion of traffic and provide also for the expected growth. The system has been co-ordinated with the plan of rail transportation and also with the prospective uses of the land. It is

[1] See Highway Traffic, Regional Survey, Volume III.

designed to facilitate convenience of movement in all directions, to provide intercommunication by the most direct routes between the populous parts of the Region, to minimize delays and to relieve local congestion by means of by-pass routes around areas where the cost of securing adequate direct passage is too great. The lines adopted have been those in which there was least resistance.

The New York region roughly resembles three-quarters of a circle, the remaining southeasterly quadrant being occupied by part of the Atlantic Ocean. The northeasterly quadrant is separated from the westerly ones by the Hudson River.

The basic plan for the highway system conforms in the main with the diagrammatic scheme for communications as depicted in Figs. 1 and 2 (pages 178 and 179). An adaptation of this for highway purposes appears in Fig. 11 (page 218). The main key of the system is the Metropolitan Loop or belt line highway, which circles the most intensively developed areas in the Region. The area within this loop corre-

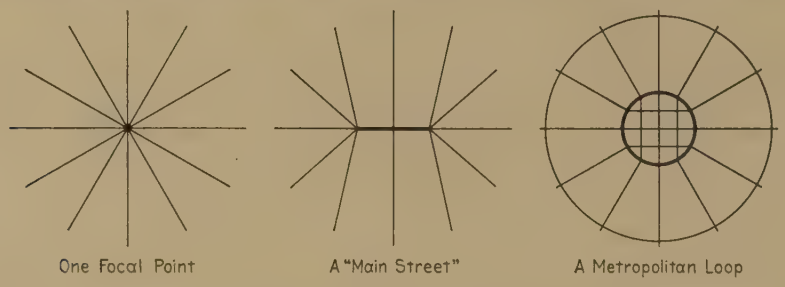


FIG. 8

DIAGRAMMATIC PRESENTATION OF VARIOUS TYPES OF HIGHWAY SYSTEMS

sponds to an enlargement of the focal point of traffic within a small community. Instead of a point or a "Main Street" the center of traffic is an area already intersected with a fairly complete system of rectangular highway routes connected at the edges of that area with many arterial highways. (See Fig. 8.)

Good examples of combinations of radial and connecting highways that include different types are shown in the accompanying illustrations of the L'Enfant plan of Washington and Christopher Wren's plan of London after the Great Fire. The L'Enfant plan shows a system of diagonal avenues superimposed on a rectangular arrangement of streets with its series of focal points and loops. The Wren plan, which was not carried out, shows a system of streets, focal points, and loops planned in conformity with a main skeleton of diagonal thoroughfares.

In the greatly enlarged scale of the New York region a system has been evolved which embodies, as far as practicable, the type of arrangement of radial and circumferential highways—in combination with an orderly street system—that will afford the best means of circulation.

THE REGIONAL HIGHWAY SYSTEM

The pattern of arterial or radial highways, supplemented by outer circumferential routes, and certain cross-connections shown on the Plan, supply means of intercommunication between all the suburban communities and between each of those communities and all parts of the central business and industrial areas. The system is believed to present the most economical arrangement for convenience of inter-

FIG. 9
THE L'ENFANT PLAN FOR WASHINGTON, D. C.

communication between a number of municipalities grouped about a large central area. It offers a choice of routes which encourages dispersal of traffic and avoids concentration. The outer termini of the radials are upon those major trunk line highways which connect the Region with the principal communities in the surrounding territory and serve as important arteries in the national highway system. They aim at distributing incoming traffic at the periphery before it reaches the congested centers. The inner routes within the loop avoid the most intensive developments by following the shores of major waterways.

A general plan of the major regional highways in the entire Region is presented on Map No. 2 in the pocket at the back of this volume. As shown on this map and on the more detailed maps in the Atlas, a very large percentage of the routes follow existing highways. In some cases these are already improved as major highways; in other cases they are as yet unpaved. No proposed widths are specified on the maps but this description will include some suggestions of the types of cross-sections which are recommended for certain typical sections of proposed routes.

Classification of Routes

The various routes included in the regional highway system have been classified —first in regard to their geographical location in the diagrammatic scheme shown

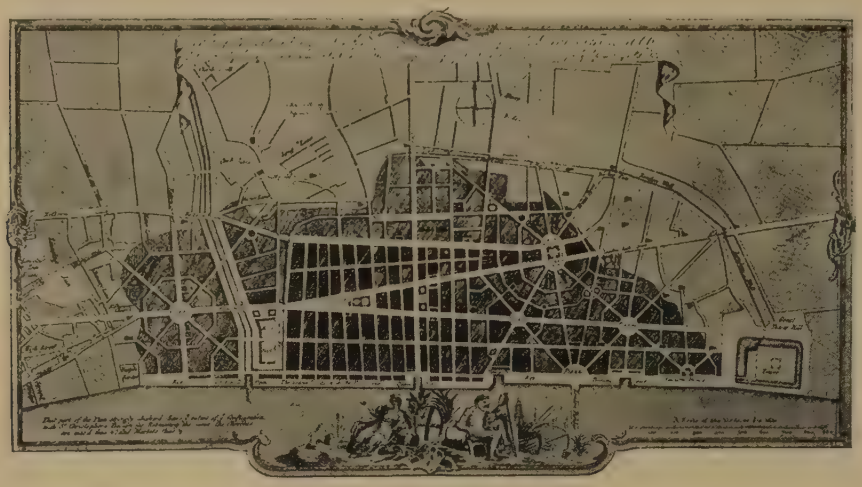


FIG. 10
THE PLAN OF SIR CHRISTOPHER WREN FOR REBUILDING LONDON AFTER THE GREAT FIRE OF 1666

in Fig. 11, and secondly in regard to their importance and special functions from a regional point of view. The relative importance of the routes has been designated by dividing them into major regional routes, minor regional routes and important connecting routes. These have been shown by three different weights of lines on the Graphic Plan. These weights do not indicate either the relative amounts of traffic which are expected on the different routes or the relative roadway widths. Minor routes in the central part of the Region may carry more traffic than major routes on the edges of the Region and may therefore require more roadway space.

The classification of major routes is designated on the diagrammatic scheme in Fig. 11 and on the key plan in Fig. 12, which shows, to a true scale, the actual locations in the Regional Plan of each of the lines shown on the diagram. This classification is

also indicated on the general plan of the highway system in the pocket at the back of this volume.

On these maps the Metropolitan Loop is marked A. The major routes within this loop form a roughly rectangular system but include important diagonal routes. They will be referred to as inner routes. Those running parallel to the Hudson River, or approximately north and south, have been labeled in lower-case letters running from "a" to "h" and "k"; those running at right angles, or approximately east and west, have been labeled in Roman numbers running from I to III. The radial routes, which connect at the Metropolitan Loop with the inner routes, have been numbered from 1 to 20. The outer circumferential routes have been marked B and C, supplementary sections of each being marked B-1, C-1 and C-2.

Major Regional Routes.—The major regional routes are those which would be used by vehicles moving to or from the Region and traveling a considerable distance within the Region. They would correspond largely with the state highway systems as such are projected at the present time. They would serve all sections of the Region and are the only routes included in the general map of the highway system shown on Pocket Map No. 2. From the point of view of their traffic functions they have been classified in the Atlas as general highways (subdivided into express routes and others), boulevards and parkways.

It is expected that these general highways would be utilized by all types of traffic. This does not necessarily mean that trucks and passenger vehicles will utilize the same roadways, as on routes which carry very heavy truck traffic it probably will be desirable to provide separate roadways for motor trucks. Certain of these general highways have been included in a system of express highways designed to facilitate vehicular movement through and around the central congested areas and to points where the multiplicity of routes or a reduction in the volume of traffic would make express routes unnecessary. These express highways should be free from grade intersections with all important intersecting highways and thus permit a comparatively uninterrupted movement of vehicles. They would be similar to the express route being constructed by the State of New Jersey from Elizabeth to the Holland Tunnel; sections of this highway were already completed in 1928.[1]

Boulevards are proposed where it is desired to have strips of land available in the highway for landscape treatment. Although not parkways they would contain some formal furnishing of trees and grass and be minor adjuncts to the park system. In most cases they would be provided with two or three separate roadways. They would not necessarily be restricted to passenger vehicles, but in many cases probably would be reserved for such vehicles. The parkways, on the other hand, are proposed as roadways within existing or proposed park lands and would form a type of express highway for passenger vehicles. The radial parkway or boulevard routes are gener-

[1] See pages 264–269 for summary of all proposed express highways.

FIG. 11

ally supplementary and parallel to proposed general traffic routes shown in Fig. 12. On Pocket Map No. 2 and in the detailed description these have been designated as routes 6-B, 10-B, etc.[1]

[1] The relation of boulevards and parkways to the highway system is discussed in more detail in a later section of this chapter, which also includes a brief summary of all proposals for such routes. (See pages 269–285.)

FIG. 12

Both the boulevards and parkways may be considered as parts of the park system and are therefore included in Pocket Map No. 4, which shows the park and parkway system.

Minor Regional Routes.—The minor regional routes supplement the major regional routes so as to complete a framework of highways to facilitate traffic movement within the various sectors of the Region. They would correspond largely with the present county highway systems, but would also include some supplementary routes which might be considered as part of the state highway systems. They are shown on the Graphic Plan under the same three functional classifications as are used for the major regional routes—that is, general highways, boulevards and parkways. The boulevards and parkways would form an extension of the system of similar routes included in the major regional highways so as to form county parkway systems similar to that which is being developed by Westchester County.

Photo by Fairchild Aerial Surveys, Inc.

EAST RIVER CROSSING OF THE METROPOLITAN HIGHWAY LOOP

Between Whitestone in the borough of Queens and Old Ferry Point in The Bronx is the most advantageous location for a bridge east of the projected Tri-borough Bridge.

Important Connecting Routes.—The important connecting routes are shown by the thin red lines on the Plan. They supplement the major and minor routes so as to facilitate a ready interchange between such routes and between the various populated centers in different parts of the Region. Existing traffic routes have been followed where they can be used to fit into the system, but several routes are proposed over new rights-of-way. While these roads are not essentially regional in importance, their inclusion in the Graphic Regional Plan seems justified as they affect, connect and pass through the areas of several municipalities and therefore their planning and construction require some form of regional co-operation. It has not been thought necessary to describe or even to list this class of routes.

Order of Description.—There follows a brief description of all the major and the principal minor regional highway routes included in the Graphic Regional Plan. While specific locations have in many cases been selected and are mentioned in the description, this has been done primarily for the sake of clearness and facility in reading the Atlas. The routes are in the general positions that are recommended, but it is expected that a more detailed study of local conditions would in many cases result in more or less deviation from the designated lines.

The major routes which form elements of the general pattern adopted for the regional highway system are first described. These are grouped according to their geographical locations and under the various route designations referred to above. Next a brief description is given of a proposed metropolitan by-pass which utilizes throughout most of its length sections of the various numbered and lettered routes. There then follows a description of the proposed system of express highways, which are entirely composed of various sections of the major routes. A summary and general description is then given of the regional system of boulevard and parkway routes; this is made up largely of major routes which form part of the general pattern of regional highways, and partly of secondary boulevards and parkways. There is then given a description of a few supplementary major regional routes not included in the preceding classifications and this is followed by a tabular summary of the most important of the minor regional routes.

Metropolitan Highway Loop

The Metropolitan Loop, designated on the maps as Route A, encircles the main centers of business and commerce. It also surrounds most of the intensively developed residential areas, but in the boroughs of The Bronx and Queens it has to pass through existing gaps in areas that are already built upon. On the average its course lies about 12 miles distant from New York City Hall.

All the main radial routes in the proposed highway system extend from the outer edges of the Region to the highway loop, and there connect with the system of inner routes already existing or designed to serve the central area. It is not expected that any vehicle would, in a single trip, pass along a large part of the loop, but that sections of it would be utilized to by-pass the congested area within it and to obtain cross-connection between different radial routes.

Connecting the boroughs of The Bronx, Queens, Brooklyn and Richmond in New York City the loop would greatly facilitate intercommunication between those boroughs and improve their connections with New Jersey centers. At the same time it would relieve the pressure upon the street system of Manhattan. In New Jersey the loop passes to the west of that part of the Watchung Mountain range between Summit to Paterson; the intensive development east of this range makes impractical the provision of an adequate route through that section. The New Jersey part of the loop

is, in general, similar to that which was proposed by the State Highway Engineer in 1926 and later adopted as part of the state highway program.

Throughout a great part of its length the Metropolitan Loop is adjacent to belt line railways included in the trunk line railroad and suburban rapid transit proposals. It would in these cases be within a proposed communications "corridor" providing

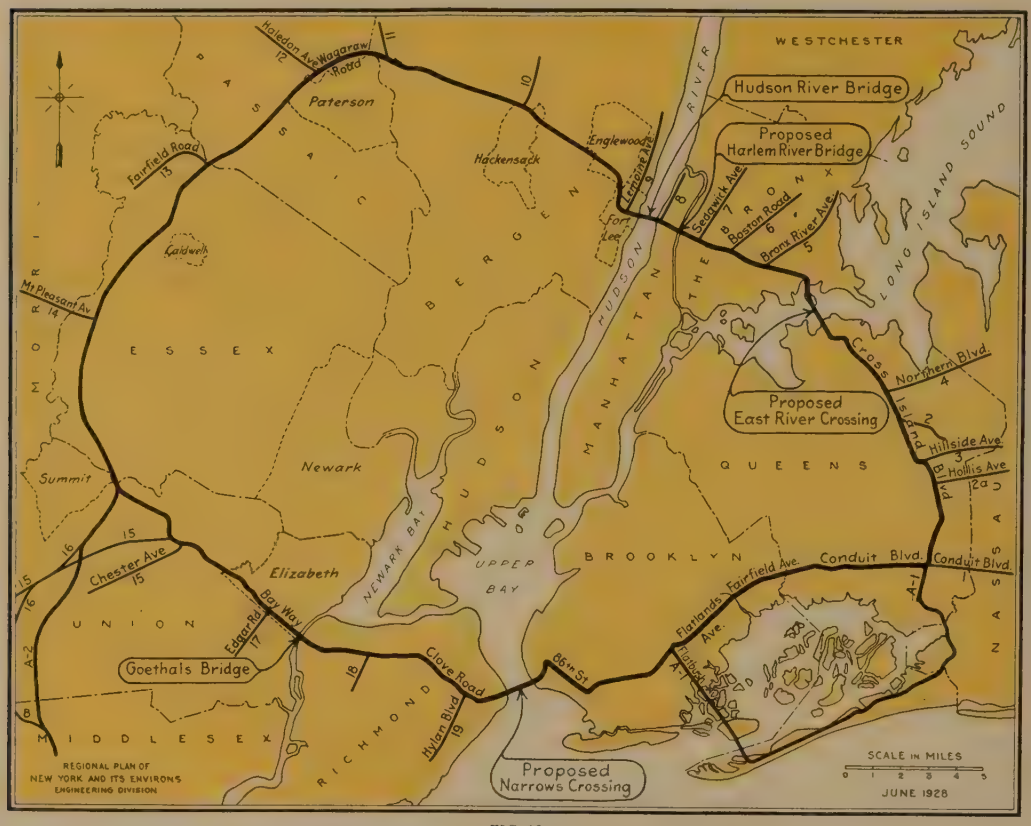


FIG. 13

PLAN OF PROPOSED METROPOLITAN LOOP HIGHWAY

Much of this highway is proposed as part of a combination of wide boulevard and certain railroad facilities; a large portion of it would be an express route. Throughout certain areas it would also have park features, as indicated on the Atlas maps. An indication of typical treatment for the arrangement of the different facilities is given in Fig. 15 (page 226).

for all major types of land communication facilities. Such a "corridor" would offer special opportunities for many types of development and the system of land uses shown on the Graphic Regional Plan has been influenced by such expectations.

Fig. 13 shows the general location of the highway loop, some of the existing streets which it follows, and the various arterial routes which it connects. It has

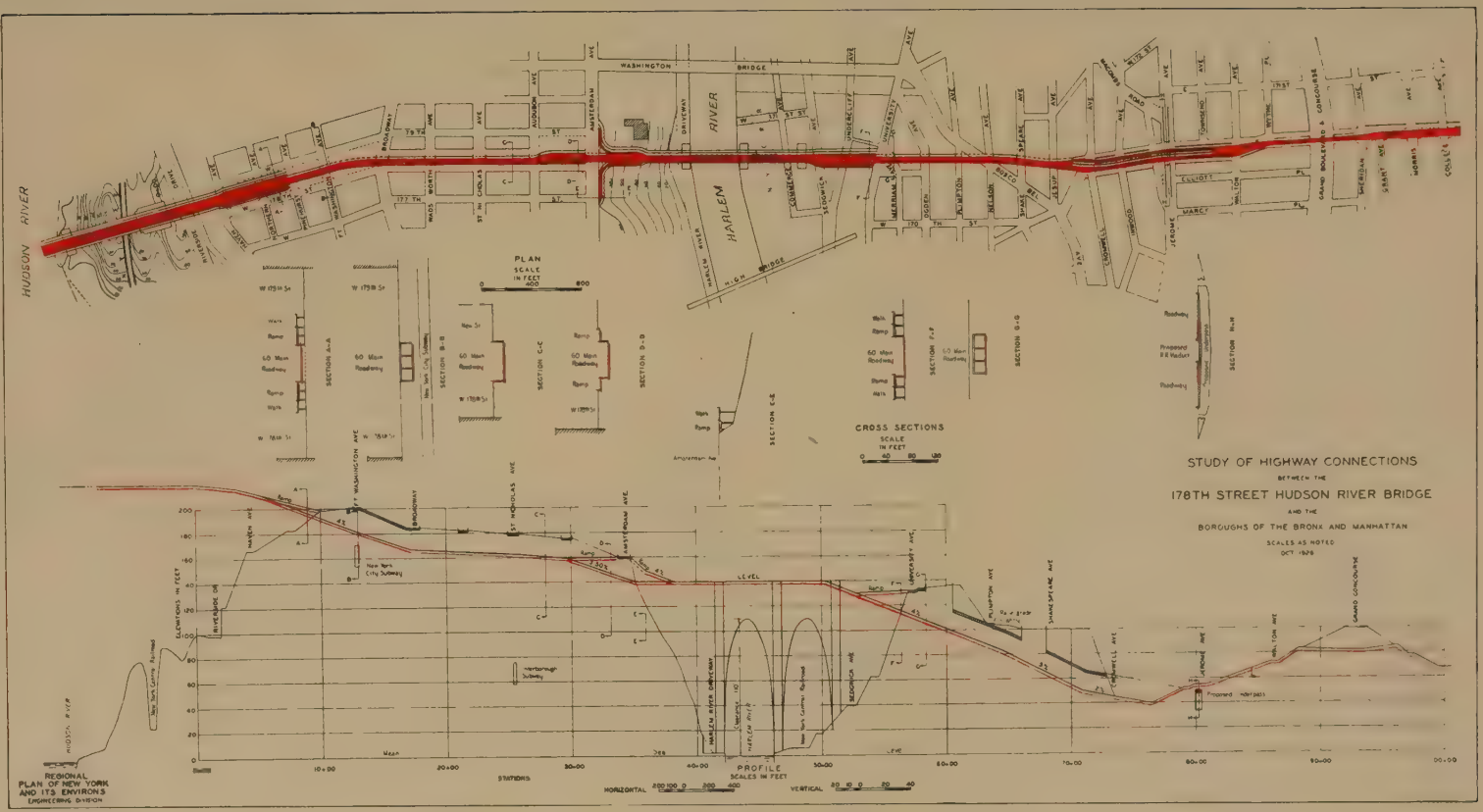


FIG. 14

PROPOSED NEW YORK CITY HIGHWAY CONNECTIONS TO THE HUDSON RIVER BRIDGE

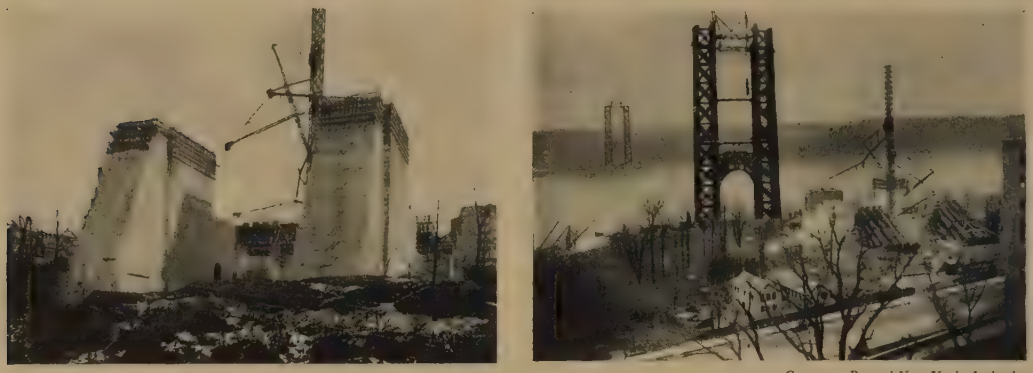
A study prepared in 1926 to show how the Metropolitan Loop highway might be developed between the Hudson River Bridge and the central part of The Bronx, so as to provide easy access to important arterial highways and freedom from congestion and delay. On April 15, 1929, the Committee of the Whole of the Board of Estimate and Apportionment gave preliminary approval to a similar plan for the area west of the Harlem River but with the addition of direct ramp connections to Riverside Drive and ramps between Broadway and the depressed drive at Fort Washington Avenue. The execution of that part of the plan east of Broadway was left to the future.

This drawing includes an extension into The Bronx by a new bridge across the Harlem River and a depressed roadway through the westerly part of that borough to meet East 170th Street at Cromwell Avenue. The continuation of the Metropolitan Loop into Queens has been indicated in Fig. 13.

The highway suggestions were worked out together with the proposals for rail connections as shown in Fig. 7 (page 202).

five crossings of major waterways, one of which (Goethals Bridge) is in existence and another of which (Hudson River Bridge) was begun in 1927. A detailed description of the route suggested is given below.

Between New Jersey and Long Island.—Beginning at the New Jersey approach to the Hudson River Bridge under construction between Fort Lee and Washington Heights, the Metropolitan Loop crosses to Manhattan by means of this bridge; thence along or parallel to West 178th Street below the street level in open cut, and by means of a suggested bridge across the Harlem River to The Bronx, where connections could be made to the existing street system at University Avenue and West 171st Street. In order to secure reasonable grades the main route would pass under University Avenue and continue in a tunnel, with sufficient openings inside the building lines to make artificial ventilation unnecessary, to a connection with West 170th Street at Cromwell Avenue. Thence the route traverses The Bronx by



Courtesy, Port of New York Authority

THE HUDSON RIVER BRIDGE UNDER CONSTRUCTION

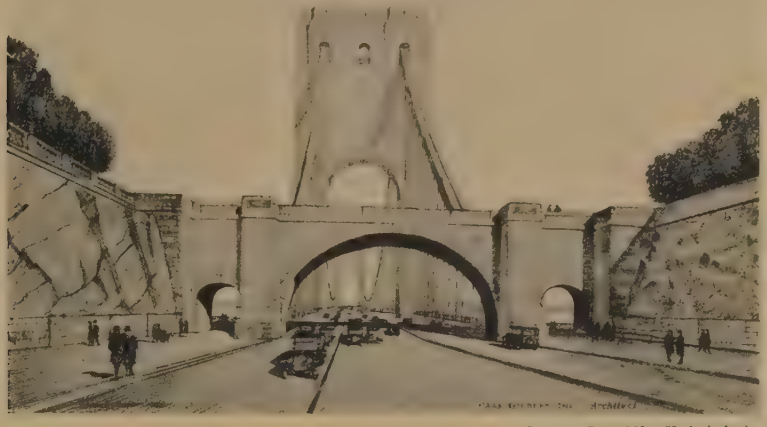
The left-hand view shows the New York anchorage on December 11, 1928, and the right-hand view shows both towers from a point east of Riverside Drive as they appeared on November 22, 1928.

means of 170th Street to Wilkins Avenue (a short connection, preferably a viaduct, being necessary between Teller Avenue and Webster Avenue), and a short connection from Wilkins Avenue to Jennings Street; thence by way of this street and an easterly extension thereof to the intersection of Randall Avenue and Ferris Avenue; and thence southerly to Old Ferry Point. The connection between The Bronx and Queens is by means of a proposed bridge across the East River between Old Ferry Point and Whitestone.

In Queens.—In the borough of Queens the proposed loop follows Parsons Boulevard, 17th Avenue, Cross Island Boulevard, Springfield Boulevard and Conduit Boulevard to Peconic Avenue, where a short connection is made with Fairfield Avenue, which avenue the route follows to the Brooklyn borough line.

In Brooklyn.—In the borough of Brooklyn, the loop follows Fairfield Avenue, Flatlands Avenue, Avenue K, Kings Highway, Avenue P, Bay Parkway, 86th Street and Seventh Avenue; thence it crosses the Fort Hamilton Government Reservation and continues across the Narrows to the borough of Richmond. It is proposed that this crossing be by either a bridge or vehicular tunnel, depending on which may prove most practical after the necessary surveys and studies have been made. Pending the completion of such a structure a modern ferry service should enable the Metropolitan Loop to function.

In Richmond.—In the borough of Richmond the highway crosses the Fort Tompkins Government Reservation and follows Vassar Place, Crawford Avenue, Fingerboard Road, Clove Road, Forest Avenue, Washington Avenue and Old Place Road. The connection across Arthur Kill between Staten Island and Elizabeth, New Jersey, is by means of the Goethals Bridge.



Courtesy, Port of New York Authority

NEW JERSEY PORTAL OF THE HUDSON RIVER BRIDGE

The cut through the face of the Palisades will be spanned by a monumental arch carrying a pedestrian promenade along the line of the top of the cliffs.

Courtesy, Port of New York Authority

GOETHALS BRIDGE OVER ARTHUR KILL

View from Howland Hook looking west toward Elizabeth.

In Union and Essex Counties.—From the westerly end of the Goethals Bridge the route follows through Elizabeth by means of Bay Way to Fay Avenue, where a connection is made to Galloping Hill Road at Grant Avenue. It proceeds through Union and Kenilworth on Galloping Hill Road to Kenilworth Boulevard, where a new extension is proposed parallel to the Rahway Valley Railroad through

Kenilworth, Union and Springfield as far as Morris Turnpike (Springfield Avenue). From this point the loop proceeds northerly through Essex County following the westerly slope of the second Watchung Range and the Passaic River valley through Millburn, Livingston, Roseland and West Caldwell (parallel to but somewhat west of proposed New Jersey State Highway No. 22); thence through Caldwell Town and across the Passaic River into Passaic County at a point between Singac and Two Bridges.

In Passaic County.—The loop traverses open country on the westerly side of the Passaic River at the foot of Preakness Mountain, through the southerly part of Wayne Township, across Totowa, on

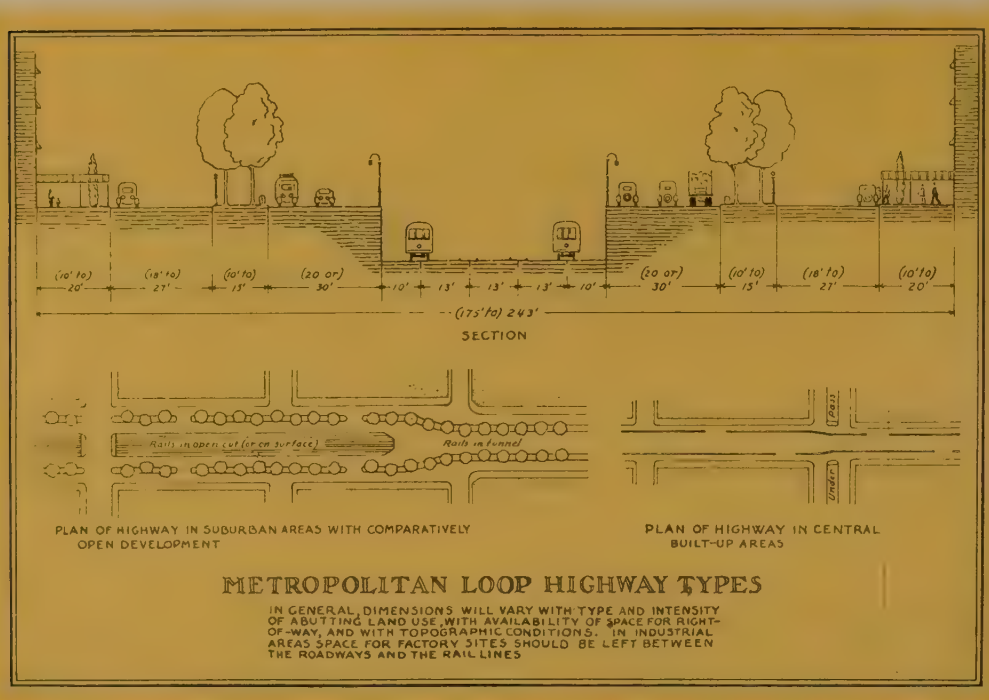

(10' to) 20'
(18' to) 27'
(10' to) 15'
(20 or) 30'
10'
13'
13'
13'
10'
(20 or) 30'
(10' to) 15'
(18' to) 27'
(10' to) 20'
(175' to) 243'
SECTION
Rails in open cut (or on surface)
Rails in tunnel
Pass
Under
PLAN OF HIGHWAY IN SUBURBAN AREAS WITH COMPARATIVELY OPEN DEVELOPMENT
PLAN OF HIGHWAY IN CENTRAL BUILT-UP AREAS
METROPOLITAN LOOP HIGHWAY TYPES
IN GENERAL, DIMENSIONS WILL VARY WITH TYPE AND INTENSITY OF ABUTTING LAND USE, WITH AVAILABILITY OF SPACE FOR RIGHT-OF-WAY, AND WITH TOPOGRAPHIC CONDITIONS. IN INDUSTRIAL AREAS SPACE FOR FACTORY SITES SHOULD BE LEFT BETWEEN THE ROADWAYS AND THE RAIL LINES

FIG. 15

the westerly edge of the built-up area of Paterson, and across Haledon and Prospect Park to Wagaraw Road in Hawthorne; thence along this road to Bergen County.

In Bergen County.—In Bergen County a new route is followed, most of which is in open country and corresponds with State Highway Route No. 4, through Fairlawn, Arcola (Paramus Borough), Cherry Hill (Riverside Borough), West Englewood (Teaneck Township), the southerly edge of Englewood and southerly through Fort Lee to the point of beginning at the Hudson River Bridge.

Extensions from Loop

Route A-1.—This is a supplementary route in Brooklyn and Queens boroughs and Nassau County which would carry an extension of the loop to the south of Jamaica

Bay and connect it with the Rockaway Peninsula in Queens and the Barren Island section of Brooklyn, where New York City is developing its first municipal airport.

Beginning at Flatbush Avenue and Kings Highway in Brooklyn, the route follows Flatbush Avenue southerly to the Rockaway Inlet; thence crosses by an improved connection, preferably by tunnel, to the Rockaway Peninsula in the borough of Queens. (There is an existing ferry across this inlet but it is expected that a direct highway connection will soon be justified.)

The route continues easterly in Queens through Jacob Riis Park and by a new connection to and along Newport Avenue (Ocean Avenue), Beach Channel Drive, Hammels Boulevard, Amstel Boulevard, Far Rockaway Boulevard, Cornaga Avenue and Empire Avenue to the Nassau County line. The route then follows Broadway (Lawrence) and the Rockaway Turnpike (Cedarhurst), meeting Rockaway Boulevard at the Queens-Nassau line; thence follows Rockaway Boulevard to a point about one-half mile east of Springfield Boulevard, where a new connection is proposed to the latter highway at about 147th Avenue. The route then follows Springfield Boulevard, terminating at Conduit Boulevard on the Metropolitan Loop.

Route A-2.—This is a second supplementary route to the Metropolitan Loop, and would serve as an extension of the New Jersey section outside of the most intensively developed parts of Union County. Via a portion of the outer circumferential Route B it would connect the westerly part of the loop with Perth Amboy and the Outerbridge Crossing over the Arthur Kill. The route followed is given below.

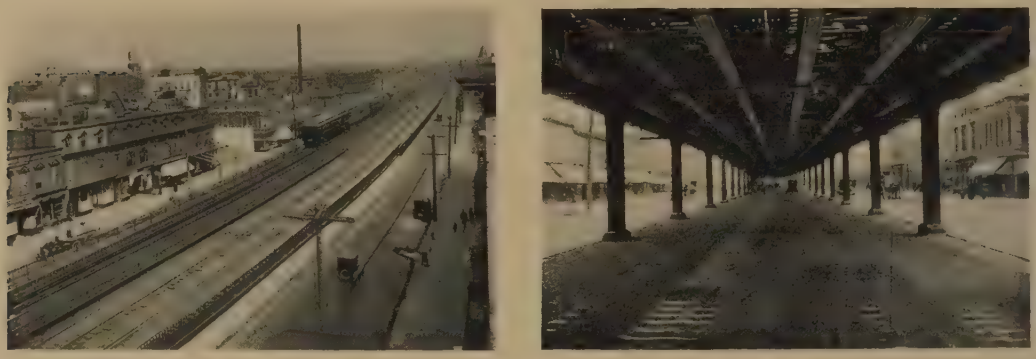
Swinging southwest from the Metropolitan Loop at a point in Springfield in the neighborhood of Briant Avenue, the route passes through Springfield and Mountainside to the intersection of Springfield Road and Mountainside Avenue, following the latter avenue to about Chestnut Street in Westfield; thence southwesterly and southerly through Westfield and Scotch Plains into Middlesex County, to join outer circumferential Route B at a point about a mile south of the Union-Middlesex County line.

Inner Routes

The inner routes have already been defined as those major regional routes which are located within the Metropolitan Loop. They have been classified into one series of approximately east and west routes and another series of approximately north and south routes. Within the loop the street system is quite definitely fixed by the intensive development that has already taken place. With few exceptions, the main highways either parallel the general direction of the Hudson River or are at right angles thereto. A few of these inner highway routes cut diagonally across parts of the area inside the loop, but as a rule the lines form a rectangular pattern and follow the two main directions referred to. Provision of new diagonal routes, except for short lengths, would be so costly as to be impractical. Desirable as such diagonal routes would be, they are not necessary to enable the regional highway system to function with reasonable efficiency. Provision is made for suitable diagonal connections between the different inner routes and the radial routes at the outer edges of the area circumscribed by the loop. Such connections are included in the Graphic Regional Plan.

The three east and west inner routes will first be described and then the nine north and south routes. As the former must cross the major waterways formed by the Hudson and East Rivers, it seems desirable to have as few such routes as will offer convenient access to all parts of the main regional center, which lies on both sides of the Hudson River. (See Fig. 1, page 178.) The three routes proposed, together with the northerly side of the Metropolitan Loop, will provide four east and west crossings of Manhattan at approximately equal distances apart and in each case forming part of a through route between New Jersey and Long Island.

Route I.—The most southerly of the east and west routes has been designated Route I. It extends from the extreme westerly portion of the Metropolitan Loop at Livingston, in Essex County, to the southerly part of the borough of Queens, in New



Courtesy, Consulting Engineer, Borough of Brooklyn

EXISTING CONDITIONS ON ATLANTIC AVENUE, BROOKLYN

The relocation of the rail lines in tunnel would make the avenue adequate for use as a major regional route. The left-hand view is looking east from Snediker Avenue and the right-hand view looking east from Alabama Avenue.

York City. In New Jersey it connects with the main highway leading to the west via Delaware Water Gap, and in Long Island it connects (over a section of the Metropolitan Loop) with the most southerly major regional route extending across Nassau and Suffolk Counties. The route passes over a section of the Watchung Mountain range, crosses the Newark metropolitan district quite near its center and passes close to the head of Newark Bay. Crossing both the Hudson and East Rivers and southern Manhattan it furnishes the most southerly major route proposed between downtown Brooklyn and metropolitan New Jersey.

From its intersection with New Jersey State Highway No. 25, in the easterly part of Newark, to and beyond its easterly terminus, this route is shown as a part of the proposed express highway system. West of Broad Street, Newark, the route corresponds, in general, with proposed New Jersey State Highway No. 10, the final location of which was still undetermined at the time the Graphic Regional Plan was prepared.

From its New Jersey terminus on the Metropolitan Loop the route follows Mount Pleasant Avenue through Livingston and West Orange; thence southerly on Gregory Avenue and easterly, partly over a new connection, to Central Avenue. Central Avenue is followed through Orange, East Orange, and Newark. From the easterly end of Central Avenue the route continues to a point on Market Street just east of the Main Line of the Pennsylvania Railroad; a determination of the best location for this section would require further studies which should take into consideration approaches to the proposed Pennsylvania Railroad and Hudson & Manhattan Transfer Station at Market Street.

The route continues along Market Street and Passaic Avenue in Newark to the express road being constructed by New Jersey as State Highway No. 25. The route follows this state highway route through Kearny and Jersey City; thence through the Holland Tunnel under the Hudson River to Canal Street in Manhattan; thence along Canal Street and over the Manhattan Bridge to Brooklyn; thence

Courtesy, Topographical Bureau, Borough of Queens

CONDUIT BOULEVARD IN THE BOROUGH OF QUEENS

Showing completed section; a 40-foot pavement on a right-of-way averaging about 70 feet in width. The view was taken November, 1928, looking east from Brookville Road.

along Flatbush Avenue Extension, Flatbush Avenue, Atlantic Avenue and Conduit Boulevard to the Metropolitan Loop near its intersection with the Rockaway Beach Division of the Long Island Railroad.

Route II.—This route, extending east and west, approximately bisects the area within the Metropolitan Loop. In New Jersey it passes through a gap between the intensely developed areas around the City of Newark and the industrial and residential areas centering around Passaic and Paterson. Its westerly terminus is on the Metropolitan Loop at West Caldwell, where it connects with a main general traffic route to the west via Lake Hopatcong. Its easterly terminus is on the Metropolitan Loop north of Hollis in the borough of Queens, where a connection is provided to two radial routes running the length of Long Island. It passes through the midtown business district of Manhattan and requires an entirely new location throughout this

section and new crossings of the Hudson and East Rivers. Most of that part of the route in the borough of Queens and to the west of Jamaica is through still comparatively undeveloped territory. Through and east of Jamaica it follows an existing major highway.

This route is shown as an express route from the westerly edge of the Hackensack meadows to the easterly shore of the East River, connecting at both of these points with proposed north and south express routes.

Beginning in the northeastern part of Caldwell Town in Essex County, the route follows Fairfield Road and Lindsley Road to the Passaic County line; thence it crosses the southerly part of Passaic County via Francis Avenue as far as the Greenwood Lake Division of the Erie Railroad; thence a new connection is proposed, parallel to the railroad, to Notch Road at Great Notch. The route follows Notch Road as far as Telegraph Road, a new connection to Stone House Plains Road at Bloomfield Road, and along the former highway to Franklin Avenue (Clifton), where a new connection is proposed to the Rutherford Avenue Bridge across the Passaic River.

The route continues across Bergen and Hudson Counties on Rutherford Avenue, an extension thereof to the Paterson Plank Road at Secaucus, the latter highway to Homestead and by a proposed tunnel under Union City, Weehawken and the Hudson River to 38th Street, Manhattan. (A vehicular tunnel under this part of the Hudson River was proposed in December, 1928, by the New York and New Jersey Bridge and Tunnel Commissions as the next step in a program for additional Hudson River crossings.) The route continues in tunnel across Manhattan under 38th Street, and under the East River to Borden Avenue, in Queens, following, throughout this section, the official proposal before the Board of Estimate and Apportionment of New York City in 1928.

In Queens the route follows Borden Avenue to Grand Avenue, and an extension to and along Caldwell Avenue as far as the New York Connecting Railroad; thence over a new route southerly and parallel to the railroad for a distance of about one-half mile, and southeasterly, crossing the railroad, to Metropolitan Avenue. The route follows Metropolitan Avenue and Hillside Avenue to the Metropolitan Loop at Cross Island Boulevard.

Route III.—This is the most northerly of the proposed east and west inner routes. Like the others, it connects the outer radial highway system in New Jersey with that on Long Island. Its westerly terminus is on the Metropolitan Loop at Totowa, in Passaic County, and there it connects, over a short section of the loop, with the same trunk highway to the west as does inner Route II. It crosses through the southern part of the city of Paterson, swings south of Hackensack and crosses the Hudson River approximately at the site of the Fort Lee Ferry. It is proposed that this river crossing be by a vehicular tunnel. Going through the Harlem section of Manhattan it crosses to the borough of Queens via the projected Tri-borough Bridge and continues through the northerly part of that borough over existing major highways, terminating on the Metropolitan Loop at its intersection with Northern Boulevard at a point east of Flushing.

Beginning in Totowa the route follows Totowa Road and Little Falls Turnpike to Paterson. Through Paterson it follows Clover Avenue, the abandoned Morris Canal from Clover Avenue to

Atlantic Avenue, Atlantic Avenue, Newark Avenue, Madison Avenue, California Avenue, 23d Avenue and Market Street.

Crossing the Passaic River it continues across Bergen County along Market Street and Essex Street as far as the westerly boundary line of Hackensack; thence a new connection (also part of inner Route "g") is proposed southeasterly to Lodi Avenue, Teterboro; thence along Lodi Avenue to a point east of Liberty Avenue in Little Ferry. From Little Ferry a new connection (corresponding to part of State Highway No. 6) is proposed to State Highway No. 5 in Palisades Park; thence a new connection is shown passing in tunnel beneath the Palisades and the Hudson River to Manhattan at West 125th Street.

The route continues across 125th Street in Manhattan, crossing the East River by means of the proposed Tri-borough Bridge (also utilized by inner Routes "e" and "f") to Potter Avenue in Queens; thence it follows Potter Avenue, Astoria Avenue and Northern Boulevard to the Metropolitan Loop at Cross Island Boulevard.

Route "a."—Route "a," extending north and south, approximately bisects the area within the Metropolitan Loop. It thus forms the main axis of the diagrammatic scheme for the regional highway system. It runs from a point on the Metropolitan Loop in the borough of Richmond just west of the proposed Narrows crossing, across the Upper Bay and along the west shore of Manhattan to the northerly part of the loop at the 178th Street Hudson River Bridge. At this point it connects with radial Route 8, which extends to the north along the east shore of the Hudson River.

VIEW ACROSS THE HUDSON RIVER FROM WEST 125TH STREET, MANHATTAN

A vehicular tunnel is suggested at this point in the river as a part of inner Route III. The skyline visible under the arches of Riverside Drive is the top of the Palisades cliffs.

As the crossing of the Upper Bay is shown over the ferry from St. George to the Battery, the importance of this section of the route as a highway is due more to its position in the diagrammatic scheme than to its potential use as a traffic artery. Through Manhattan, Route "a" would form the main north and south route and has been shown as part of an express highway from the Battery to and beyond its northerly crossing of the Metropolitan Loop. (Plans for an elevated express highway along parts of this route have been approved by the Board of Estimate and Apportionment. In August, 1928, it approved the section between West 59th and West 72nd Streets, and in January, 1929, the section between Canal and West 59th Streets. There was before the Board at that time a project for extending this express highway northerly along the Hudson River waterfront to a point in the borough of The Bronx.)

In the borough of Richmond the route follows Hylan Boulevard and Bay Street to St. George. The Upper Bay is crossed by the ferry from there to the Battery in Manhattan. From the Battery to West 60th Street the route follows the marginal way or streets, such as West Street, 11th Avenue, 13th Avenue, 12th Avenue and New 12th Avenue. From West 60th Street to West 178th Street, where the route meets radial Route 8, it is expected that the highway would be above the New York Central Railroad tracks, an improvement that has been advocated for many years and is provided for in the plan of the West Side Improvement Engineering Committee under negotiation in 1928 between the city and

Photo by Hamilton Maxwell, Inc.

AIRPLANE VIEW SHOWING EXPRESS HIGHWAY ROUTES ON BOTH SIDES OF THE EAST RIVER
The East Side highway in Manhattan forms part of inner Route "b" and the Queens-Brooklyn highway is part of inner Route "e."

the railroad company. The Port of New York Authority has made studies for a connection between this route and the plaza of the Hudson River Bridge at 178th Street and stated that such a project is feasible.[1]

Route "b."—Route "b" is similar in function to Route "a," but passes on the easterly side of Manhattan Island. Its southerly terminus is also in the borough of Richmond on the Metropolitan Loop west of the proposed Narrows crossing, and it terminates at the Metropolitan Loop where it crosses the Bronx River in the borough of The Bronx, connecting at this point with radial Route 5, which follows the

[1] First Progress Report on Hudson River Bridge, Port of New York Authority, January 1, 1928, page 39.

north shore of Long Island Sound. This route is also shown as part of an express route extending from the Battery to and beyond its northerly terminus.

The Manhattan shore of the East River has been followed all the way from the Battery to the mouth of the Harlem River. Most of the waterfront in this section of the borough has been sadly neglected and now offers the city exceptional opportunities for an improved type of development.[1] It is proposed that provision be made for a continuous highway for the most part on or adjacent to the waterfront so designed as to permit practically uninterrupted traffic movement. Through those sections where docking and industrial facilities should be provided this would require a two-story development, the lower level being used for certain forms of waterborne commerce, for local vehicular purposes and for general access to the waterway.

Certain sections of this waterfront are undergoing extensive rebuilding with high-class apartment buildings. The demands of ocean-going steamers for additional docking facilities on the Hudson River waterfront will inevitably increase the use of the East River for bringing to Manhattan the coal, building materials and other local freight which can be economically handled by water. A marginal street system should be laid out both to handle the increases in trucking and passenger vehicle traffic with the maximum possible efficiency, and at the same time to increase the harbor facilities.[2]

The southerly part of the route is identical with inner Route "a," following Hylan Boulevard and Bay Street in the borough of Richmond and crossing to Manhattan by ferry. In Manhattan, the route continues on the easterly waterfront following South Street and East Street to Houston Street. From that point north to the Willis Avenue Bridge over the Harlem River, the route is shown just inside of the bulkhead line, utilizing all existing or mapped marginal streets and along a new right-of-way where no such streets are available. (The preliminary suggestions of the Regional Plan prepared under the direction of Mr. Nelson P. Lewis in 1921–22, included such a route. It was also included in the general plan presented in the 1923 Annual Report of the President of the borough of Manhattan, who presented a specific plan for such a route between the Battery and East 54th Street to the Board of Estimate and Apportionment in January, 1929.)

The route crosses to The Bronx on the Willis Avenue Bridge and continues on Southern Boulevard, Whitlock Avenue, Liggett Avenue, Garrison Avenue and an extension thereof across the Bronx River to Bronx River Avenue; thence along the latter avenue (mapped but not yet acquired in 1928) to the Metropolitan Loop at a point just north of Westchester Avenue.

Route "c."—Route "c" is the most easterly of the north and south routes which cut across the New Jersey part of the area within the Metropolitan Loop. There is now no continuous route along the easterly shore of Hudson County and this would supply this need. Starting in the northerly part of the borough of Richmond at the intersection of the loop and radial Route 18, it crosses to Bayonne over the Kill van Kull Bridge (construction started in 1928) and continues through the easterly sections of Bayonne and Jersey City. It crosses through the westerly part of Hoboken

[1] See specific proposals in Plan Volume II.

[2] See page 208 under Waterways.

and in Weehawken climbs to the top of the ridge which forms the southerly terminus of the Palisades. It follows this ridge, as part of a proposed boulevard and parkway route overlooking the Hudson River, to the Metropolitan Loop at the westerly approach of the Hudson River Bridge between Fort Lee and Washington Heights. At this point it connects with radial Route 9-B, which extends north along the westerly shore of the Hudson River.

Beginning in the borough of Richmond at Forest Avenue a few hundred feet east of Morningstar Road the route extends northerly over a new right-of-way (proposed by the City of New York) to connect with the Kill van Kull Bridge, via which it crosses to Bayonne.

The route continues through Bayonne via Hudson Boulevard, North Street, West 8th Street and Avenue E to the Jersey City line. In Jersey City it follows Princeton Avenue to a point south of the

Courtesy, Port of New York Authority

KILL VAN KULL BRIDGE BETWEEN BAYONNE AND PORT RICHMOND

Lehigh Valley Railroad, where a connection is made to the right-of-way of the abandoned Morris Canal; thence along the canal bed to Varick Street and northerly along Varick Street, Cole Street and a connection to and along Marshall Street, Hoboken. From Marshall Street a new connection is proposed to the Hackensack Plank Road in Weehawken; thence along this latter highway to Hudson County Boulevard East; thence along that boulevard (with a straightening recommended between Guttenberg and North Bergen) to its intersection with Bulls Ferry Road; thence, via a new connection proposed along the top of the ridge, to Hudson Terrace at a point a few hundred feet south of Main Street in Fort Lee; thence along Hudson Terrace to connect with radial Route 9-B at the Metropolitan Loop.

Route "d."—Route "d" is closely parallel to Route "c," but on the west side of the narrow ridge which extends along the easterly part of Hudson County. Its southerly terminus is at the same point as the latter route and it utilizes the same crossing into Bayonne. Throughout the New Jersey section of the route it corresponds, in general, with proposed State Highway No. 1, but between the northerly part of Jersey City and Ridgefield it is shown on the easterly edge of the Hackensack meadows,

whereas the route proposed for the state highway is on higher ground east of the Erie Railroad (shown as a secondary route on the Graphic Regional Plan). After crossing into Bergen County, Route "d" climbs up the ridge formed by the Palisades and terminates just west of the Fort Lee approach of the Hudson River Bridge.

North of its intersection with inner Route I in Jersey City, Route "d" is part of a proposed express route extending to and beyond its northerly terminus.

The route follows inner Route "c" from the Metropolitan Loop in the northern part of the borough of Richmond to and across the projected Kill van Kull Bridge. At the Bayonne terminus of the

Photo by Fairchild Aerial Surveys, Inc.

PROPOSED INNER ROUTES I AND "C"
Looking northeast from a point over Jersey City.

bridge it swings to the edge of Newark Bay; thence along the east shore of the bay, as a new waterfront highway, to the right-of-way of the abandoned Morris Canal at the Bayonne-Jersey City line. Through Jersey City the route follows the old Morris Canal from the southerly city line to Glendenny Avenue; thence by a new connection to Tonnelle Avenue at a point near Spruce Street; thence along Tonnelle Avenue and New County Road to the westerly side of the Northern Railroad of New Jersey.

The route then follows a new right-of-way on the edge of the Hackensack meadows and parallel to the tracks of the Northern Railroad of New Jersey to Ridgefield, where it crosses the railroad and, still on a new right-of-way, climbs the ridge in a northeasterly direction and passes through Palisades Park and Fort Lee to the Metropolitan Loop at a point about one-half mile west of the New Jersey terminus of the Hudson River Bridge.

Route "e."—Route "e" is the first north and south inner route to the east of the East River and parallels that river for a considerable part of its length. Starting on the Metropolitan Loop in the Fort Hamilton section of Brooklyn, it passes on the edge of the main business district of that borough and furnishes a much needed connection between the downtown sections of Brooklyn and Queens. Such a connection has been proposed by various Brooklyn and Queens organizations for many years and was being studied by the city authorities in 1927. Connecting with the main vehicular approaches to Manhattan, and affording an outlet to The Bronx and points north via the projected Tri-borough Bridge, it would do much to relieve the existing pressure of traffic from Brooklyn and Queens on the north and south highways in Manhattan. Through the borough of The Bronx this route follows the east shore of the Harlem River and Sedgwick Avenue, connecting at the Metropolitan Loop with radial Route 7.

Photo by Fairchild Aerial Surveys, Inc.

MAJOR HIGHWAY ROUTES IN THE NORTHERN PART OF THE BOROUGH OF QUEENS

View looking east from over Long Island City.

It would bring the north and south sides of the Metropolitan Loop within easy reach of the intensively developed areas in Brooklyn and Queens and through these parts of the loop would provide two routes to New Jersey and the west which would not necessitate passing through the congested areas of Manhattan. From its intersection with inner Route I, at Atlantic Avenue, to the Bronx terminus of the Tri-borough Bridge, it forms part of the proposed express highway system.

Beginning in Brooklyn at 86th Street and Seventh Avenue, the route follows 86th Street northwest to Fourth Avenue; thence northerly on Fourth Avenue to a point a few blocks south of Atlantic Avenue, whence a short connection is proposed to Sixth Avenue at Flatbush Avenue. The route continues along Sixth Avenue as far as Atlantic Avenue where a new connection is proposed to Washington Avenue, in the neighborhood of DeKalb Avenue. (The section between Fourth Avenue and this point would cut through built-up areas and be a very costly project, but a major operation of this kind seems justified in this instance. Further studies may discover a better detailed location which would serve the same purpose.) The route then follows Washington Avenue, Kent Avenue, Morton Street, Bedford Avenue and a proposed extension thereof to and along Oakland Street. From this point a vehicular tunnel is proposed under Newtown Creek to East Avenue in Queens and connecting with the proposed vehicular tunnel under the East River to Manhattan. (A project for the latter tunnel including a connection to Oakland Street, Brooklyn, is before the Board of Estimate and Apportionment, which voted funds in 1927 for preliminary engineering studies.)

The route continues through Queens via East Avenue, Jackson Avenue and Van Alst Avenue to the projected Tri-borough Bridge (also used by inner Routes III and "f"), which furnishes the connection to The Bronx. The route continues through The Bronx via Cypress Avenue, East 138th Street, Exterior Street and Sedgwick Avenue, connecting with radial Route 7 where it passes under the Metropolitan Loop opposite West 171st Street.

Route "f."—Route "f" forms a second crosstown connection between the boroughs of Brooklyn and Queens, but passes outside of the most intensively developed residential areas in the southerly part of Brooklyn and in the Long Island City and Astoria sections of Queens. Starting in the Flatlands section of Brooklyn it provides an extension of the boulevard system furnished by Kings Highway through the Bushwick section to connections with Queens and Nassau Boulevards in the borough of Queens. There is now no direct or adequate highway connection between these points. It joins Route "e" at the Tri-borough Bridge and then swings north through The Bronx to connect at the Metropolitan Loop with radial Route 6.

Beginning on the Metropolitan Loop at Kings Highway and Avenue K in Brooklyn, the route follows Kings Highway, Howard Avenue and Palmetto Street, and cuts across to Woodbine Street at about the borough line. Through the borough of Queens it follows Woodbine Street and a new connection from there to Prospect Avenue; thence along Prospect Avenue and Eliot Avenue as far as the New York Connecting Railroad. Up to this point the route is shown as an existing or proposed boulevard.

The route then continues as a general highway parallel to the New York Connecting Railroad and on its westerly side to a point between Broadway and Jackson Avenue; there it crosses to the easterly side of the railroad and parallels it again as far as Astoria Avenue, where the route connects with Potter Avenue and follows the latter avenue to the projected Tri-borough Bridge (also used by inner routes III and "e"), over which it crosses to The Bronx. The Bronx section of the route follows St. Ann's Avenue, Third Avenue and Boston Road to the Metropolitan Loop at East 170th Street.

Route "g."—The first inner route to the west of Newark Bay and the Hackensack meadows has been designated Route "g." It forms part of a major north and south trunk highway which parallels the Hudson River back of the Palisades and connects with the main route to Philadelphia on the south.

All of Route "g" is shown as a proposed express highway. Beginning at the Metropolitan Loop in Elizabeth it follows the express highway being constructed by New Jersey as State Highway Route No. 25 to an intersection with inner Route I in Newark; thence it continues over a new right-of-way on the westerly edge of the Hackensack meadows to the Metropolitan Loop at a point north of Hackensack.

Beginning on the Metropolitan Loop in Elizabeth at Edgar Road and Bay Way, the route follows New Jersey State Highway No. 25 (being constructed as an express highway and partly completed in 1928) by a new connection to Spring Street at East Jersey Street; thence along Spring Street to the Newark lines; thence through Newark along Carnegie Avenue, Haynes Avenue, Avenue I and on the east side of and adjacent to the Pennsylvania Railroad freight line to Passaic Avenue (Lincoln Highway). Leaving the state highway at this point it continues on a new right-of-way along the railroad and across the Passaic River to Kearny; thence in a northwest direction to the westerly side of the Hackensack meadows; thence northeasterly along the edge of the meadows to meet inner Route III near Lodi Avenue in Teterboro; thence along Route III through the southwest corner of Hackensack to Essex Street; thence, still on a new right-of-way, along the westerly border of Hackensack to meet the Metropolitan Loop in the southeast corner of Paramus Borough.

Route "h."—Route "h" passes along the foot of the easterly slope of the First Watchung Mountain range in New Jersey from Springfield to Paterson, and follows existing rights-of-way throughout its length. It passes on the westerly edge of the built-up sections in the Oranges and Montclair and would provide easy interconnection between these communities and points to the north and south. Its southerly terminus connects with radial Route 16, a proposed main highway to Philadelphia via Lambertville. While the route follows existing highways these should be widened and improved in many cases so as to form a continuous route. At present it is difficult for a motorist to recognize it as a continuous route.

Beginning at the Metropolitan Loop in the northerly section of Springfield Township in Union County a short connection is proposed to Millburn Avenue and Springfield Road; thence the route proceeds northerly through Essex County and into Passaic County following Millburn Avenue, Wyoming Avenue, Gregory Avenue, Mountain Avenue (West Orange), Upper Mountain Avenue, Mountain Avenue (Montclair), North Mountain Avenue, Lorraine Avenue, Valley Road and Barclay Street (Paterson) to the right-of-way of the abandoned Morris Canal where it meets inner Route III. Over the latter route, connection would be made to the Metropolitan Loop at Totowa, or via a secondary route through Paterson and Fairlawn to radial Route 11.

Route "k."— Route "k" is an intermediate inner route between Routes "g" and "h." Branching off of Route "g" in the southerly part of Newark it goes through the business center of that city and follows the Passaic River, mostly as a proposed boulevard and parkway route, to terminate on the Metropolitan Loop in Hawthorne, where a convenient connection is provided to radial Route 11. The route forms an important part of the regional boulevard system and its development would do much to increase the attractiveness of the shores of the Passaic River south of Paterson.

Beginning at Haynes Avenue in Newark at a point on inner Route "g" (also New Jersey State Highway No. 25 in this section) a new connection is proposed to Broad Street at Ponier Street; thence the route follows Broad Street, Belleville Avenue, Washington Avenue, John Street (Belleville) and Main Street (Belleville).

From the bridge over the Passaic River at Rutgers Street the route is shown as a proposed boulevard to its northerly terminus. It follows Main Street, River Road and a short extension thereof to and along River Road (Clifton) to the southerly boundary line of Passaic; thence it crosses to the easterly side of the Passaic River and follows a new right-of-way through Wallington, connecting with River Drive in Garfield; thence along River Drive and crossing to the westerly side of the Passaic River at

Photo by Fairchild Aerial Surveys, Inc.

PROPOSED INNER ROUTES I AND "k"
View looking northwest from over Newark.

Outwater Lane. The route continues northerly by a connection to Randolph Avenue (Clifton); thence along Weasel Road and the Boulevard (a mapped street in Paterson which, together with Weasel Road and Randolph Avenue, is part of State Highway No. 3); thence along First Avenue and the 19th Street Bridge over the Passaic River to a connection with the Metropolitan Loop in Hawthorne.

Radial Routes

There are included in the major regional highways shown on the Graphic Regional Plan twenty radial routes which have been numbered in a counter-clockwise direction, Route 1 being on the south shore of Long Island and Route 20 near the Atlantic Coast in the eastern part of Monmouth County. Some of these radial routes

are supplemented by parallel boulevards or parkways. The latter are not shown in Fig. 12 (page 219), but are included on Pocket Map No. 2, where they are marked with the letter "B" in addition to the number of the highway route which they supplement. These boulevard and parkway routes are discussed in more detail in a later section of this chapter where they are described as part of a proposed complete regional system of such routes.[1]

On Long Island there are four radial routes with two supplementary boulevards or parkways. That part of the Region lying between Long Island Sound and the Hudson River contains four radial routes with three supplementary routes. Within that part of the Region west of the Hudson River there are twelve radial routes and two radial boulevard or parkway routes.

The radial routes connect at the Metropolitan Loop with the system of inner routes already described and therefore serve as extensions of those routes from the loop to the outer parts of the Region. They are described in that manner below.

Route 1.—Radial Route 1 starts at the southeast corner of the Metropolitan Loop and connects over a short section of the loop with inner Route I. It is the most southerly major route suggested on Long Island and would serve the intensively developed suburban areas in the southern parts of Nassau and Suffolk Counties. From the Metropolitan Loop to near the Suffolk County line it is shown as a proposed express highway utilizing the Conduit (Sunrise) Boulevard, a new state highway which was practically completed in 1928. The Merrick Road has for many years served as the only through traffic artery in this section of Long Island and has become very heavily congested. The proposed route should afford much needed relief to this highway and enable the latter to serve the local traffic demands which an intensive suburban development has created.

Beginning at the intersection of Springfield and Conduit Boulevards in the borough of Queens, the route follows the latter boulevard (under construction in 1928) across Nassau County; thence through Suffolk County along Railroad Avenue, a short new connection, Oak Street (Amityville) and other existing highways and several proposed connections, continuing, south of and close to the Montauk Division of the Long Island Railroad, through Lindenhurst, Babylon and Brightwaters to Bayshore. At Bayshore the route crosses to the northerly side of the railroad and follows existing highways through Islip and East Islip to the Montauk Highway (Sunrise Trail) just east of Great River Station; thence along the Montauk Highway to terminate on radial Route 2-B (see page 242) at Amagansett near the extreme eastern tip of Long Island.

Route 1-B.—A boulevard and parkway route is also proposed along the south shore of Long Island. Through Nassau and part of Suffolk Counties such a route is being developed by the Long Island State Park Commission as the Southern State Parkway. The section of this west of the Hempstead Reservoir was open to traffic in 1927 and other parts were under construction in 1928. Route 1-B utilizes this

[1] See pages 269–285. Fig. 20 (page 273) shows all such routes in map form.

parkway with suggested extensions on both the easterly and westerly ends. It passes directly to the north of the intensive residential areas which have grown up along the Montauk Division of the Long Island Railroad, but is near enough to them to be readily accessible.

Starting in the borough of Queens on the Metropolitan Loop at Central Avenue and Springfield Boulevard (where it connects with a similar route proposed within the loop and crossing the boroughs

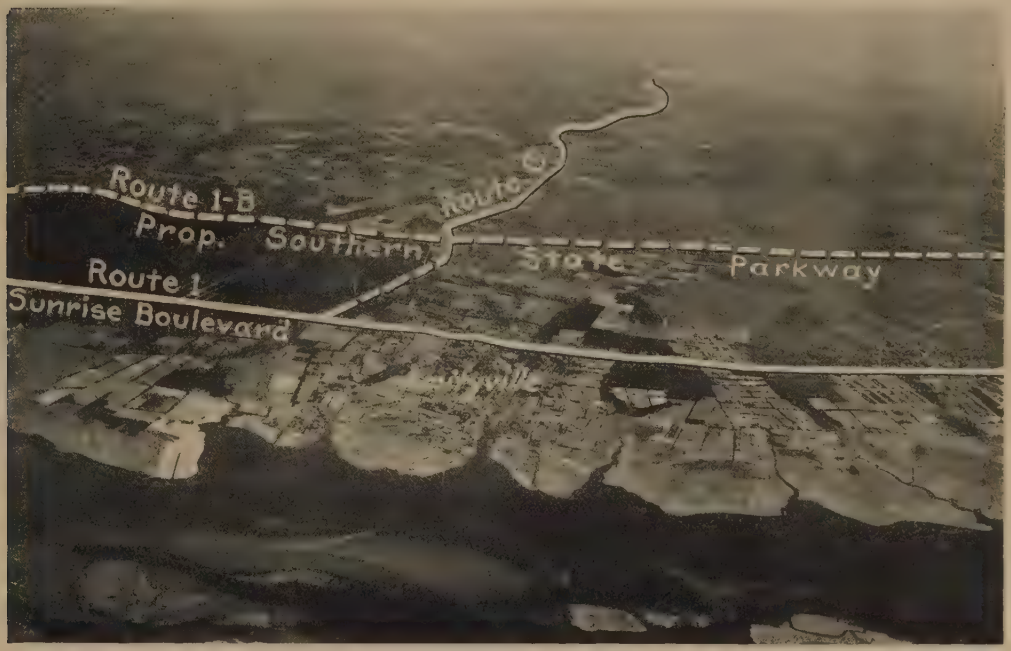


Photo by Fairchild Aerial Surveys, Inc.

RADIAL ROUTES 1 AND 1-B AND OUTER CIRCUMFERENTIAL ROUTE C
Looking north across Long Island from a point south of Amityville.

of Brooklyn and Queens[1]), the route follows Central Avenue; thence along Southern State Parkway through Nassau County (with a proposed new crossing over Hempstead Reservoir) and part of Suffolk County. It swings north of Bayshore and Islip and then turns south to meet radial Route 1 at East Islip where a convenient connection is proposed to Deer Range State Park. Practically all of this route is shown over a proposed new right-of-way.

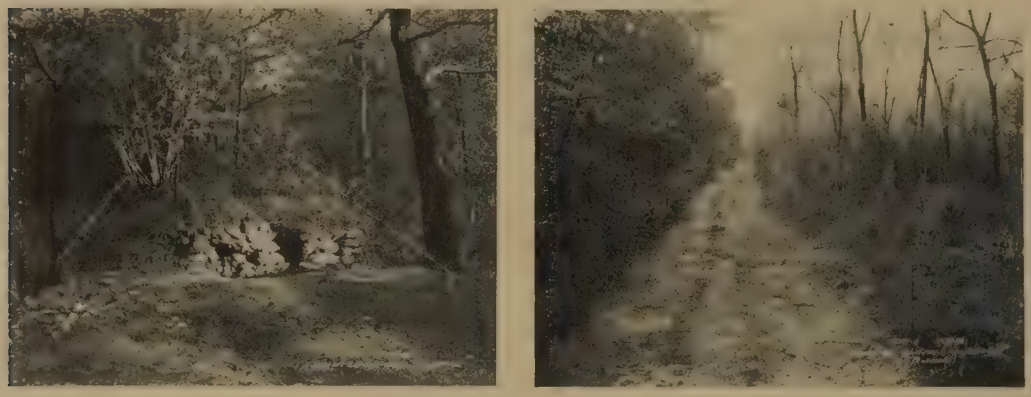
Route 2.—Route 2 traverses the south central portion of Long Island and is shown as having two connections with the Metropolitan Loop (marked in Fig. 12 and on Pocket Map No. 2 as Routes 2 and 2-A, respectively). Route 2-A joins the loop east of Hollis;

[1] See parkway and boulevard route No. 35, page 285.

Route 2 joins it about three miles farther north, and they meet at Floral Park. Route 2 connects over a short section of radial Route 3 with inner Route II. It roughly parallels the Main Line of the Long Island Railroad all the way to Riverhead; thence it swings southeast and joins radial Route 1 on the south side of Great Peconic Bay.

Traversing level country and avoiding intensively developed areas, this route would furnish direct service to all the central part of Long Island. It has been shown as part of the proposed express highway system from its northerly connection with the Metropolitan Loop to Farmingdale.

Starting at Cross Island Boulevard (a mapped street) near its intersection with North Hempstead Turnpike the route follows the old Stewart Railroad right-of-way and crosses to the south side of the



Courtesy, Topographical Bureau, Borough of Queens

VIEWS OF THE OLD STEWART RAILROAD RIGHT-OF-WAY IN NORTHERN QUEENS

Proposed as a major regional route which is to be an express highway east of its intersection with the Metropolitan Loop. Left-hand view is looking south at 75th Avenue and right-hand view looking north from Hollis Court Boulevard.

Main Line of the Long Island Railroad at Floral Park; thence easterly and parallel to that branch of the railroad to Old Country Road; thence along that road through Mineola and to the Long Island Motor Parkway. The route then follows the Motor Parkway (which it is assumed may eventually be publicly acquired) easterly to a point west of Farmingdale, where a short connection is made to Conklin Street, which is followed to the Nassau-Suffolk County line. The route continues through Suffolk County, parallel to the Main Line of the Long Island Railroad and mostly along existing highways but with several proposed new connections, to Riverhead; thence through Riverhead (coinciding at this point with a section of radial Route 3) and southeasterly along Flanders Road and Riverhead Road to radial Route 1 at Good Ground.

Route 2-A starts at the intersection of Cross Island Boulevard (a mapped street) and Hollis Avenue in the borough of Queens and follows Hollis Avenue, Springfield Boulevard, Paulding Street and an extension thereof to meet radial Route 2 at Floral Park.

Route 2-B.—New York City has recently developed Nassau Boulevard through the northerly part of the borough of Queens. The Grand Central Parkway (a mapped

street the immediate acquisition of which was under consideration in 1928) also crosses northern Queens along the ridge of hills which extends the length of Long Island. Route 2-B provides an extension of these routes as a parkway throughout the central part of Long Island. Avoiding the expensive private estates in the northern part of Nassau County it passes through the beautiful hilly country in the westerly part of Suffolk County and the Upton National Forest in the central part of that county. It crosses radial Route 2 near its eastern terminus, and parallels radial Route 1 between Good Ground and the terminus of the latter at Amagansett. Its own terminus is at Hither Hills State Park within ten miles of Montauk Point.

Courtesy, Commissioner of Highways, New York State

JERICHO TURNPIKE EAST OF SYOSSET, LONG ISLAND
Recently widened by the State of New York to 40 feet.

Starting from the Metropolitan Loop at the intersection of Cross Island Boulevard and Grand Central Parkway (both mapped streets) the route follows the projected Grand Central Parkway to the Nassau County line, where an extension is proposed to the Long Island Motor Parkway at Lakeville Road. The route follows the Motor Parkway to a point south of Albertson, whence it continues due east as a parkway along a new right-of-way to the Half Hollow Hills; here it joins the Motor Parkway again and follows it to its terminus at Lake Ronkonkoma. From this point the route extends easterly along a new right-of-way following the higher elevations and passing through the Upton National Forest, Manorville and Canoe Place, south of Sag Harbor and north of Easthampton. At Amagansett it meets the terminus of radial Route 1 and continues parallel to the Montauk Division of the Long Island Railroad to Hither Hills State Park.

Route 3.—This radial route traverses the north central part of Long Island mostly through undeveloped country and connects with inner Route II. Starting from the Metropolitan Loop northeast of Hollis in the borough of Queens it is very largely over existing highways and extends to Greenport near the northeastern tip of Long Island.

Beginning at the intersection of Cross Island Boulevard (a mapped street) and Hillside Avenue the route follows Hillside Avenue (partly existing and partly being acquired in 1928) to the Nassau County line, where an extension is proposed to East Williston Avenue. The route continues along this highway to the Jericho Turnpike which it follows to Smithtown; thence by Main Street (Smithtown) and Middle Country Road to Riverhead; thence over existing highways through Mattituck and Southhold to Greenport.

Route 4.—Route 4 connects with inner Route III at the Metropolitan Loop and extends along the north shore of Long Island, passing at the head of the various deep bays which indent that shore line. Practically all of it is over existing highways which already serve as the main traffic route connecting the communities on the north side of the Island. It terminates on radial Route 3 at Mattituck on the north shore of Great Peconic Bay.

Courtesy, Commissioner of Highways, New York State

JERICHO TURNPIKE AT NASSAU-SUFFOLK COUNTY LINE

Showing congestion caused by narrowing from 40 feet to 20 feet.

Starting east of Flushing at the intersection of Cross Island Boulevard and Northern Boulevard the route follows the latter highway to the Nassau County line; thence along the North Hempstead Turnpike, with a proposed viaduct across the valley at Roslyn, to the Suffolk County line. The route continues through Suffolk County on existing highways by-passing the community of Cold Spring Harbor to the south and going through Huntington (Main Street), Centerport and Northport (Washington Street, Vernon Avenue and Waterside Avenue) to Fort Salonga; thence to and along Sunken Meadow Road and Cordwood Road to the Nissequogue River across which a new connection is proposed. On the easterly side of this river the route follows Bony Lane, Horse Race Lane, Moriches Road and Three Sister Road to the North Country Road, northeast of St. James; thence along the North Country Road through Port Jefferson and to Wading River; thence along existing highways through Centerville and Northville, terminating at radial Route 3 in Mattituck.

Route 5.—The first major regional highway to the north of Long Island Sound is designated radial Route 5. This extends from the Metropolitan Loop in The Bronx to and through the City of Bridgeport. Through Westchester County it follows the projected Pelham-Port Chester Parkway and within Connecticut it follows, throughout most of its length, the Boston Post Road. It connects at the Metropolitan Loop with inner Route "b" and also, via a connection labeled Route 5-A, with the proposed crossing from Old Ferry Point in The Bronx to Whitestone in the borough of Queens. From inner Route "b" at the Metropolitan Loop and also from Old Ferry Point via Route 5-A, to the state line between New York and Connecticut this route forms part of the proposed express highway system. It would be the main trunk highway between New York City and New Haven and Boston.

Beginning at the Metropolitan Loop just east of the Bronx River in The Bronx, the route follows Bronx River Avenue (a mapped street), East Tremont Avenue, Silver Street and Eastchester Road to Haswell Street; thence a new connection is proposed parallel to and on the easterly side of the Harlem River Branch of the New York, New Haven & Hartford Railroad, crossing the railroad east of Baychester Avenue to Hutchinson Avenue (a mapped street). Route 5-A begins at the Metropolitan Loop at Foote Avenue and Ferris Avenue in The Bronx and follows the latter highway and an extension thereof to Appleton Avenue at East Tremont Avenue; thence along Appleton Avenue and an extension thereof to meet Route 5 at a point south of Pelham Parkway.

Route 5 continues along the mapped course of Hutchinson Avenue with an extension thereof to the Westchester County line. In Westchester County the route follows the projected Pelham-Port Chester Parkway to the Fairfield County line. This parkway (designed by the county as an express highway) follows the Boston Post Road to the westerly part of New Rochelle and then utilizes a new right-of-way

Courtesy, Connecticut State Highway Department

BOSTON POST ROAD IN NORWALK, CONNECTICUT
This road was widened to 36 feet in 1925.

acquired by the county north of and approximately parallel to the New York, New Haven & Hartford Railroad. Just west of the state line the route rejoins the Boston Post Road and follows this highway through Fairfield County to Southport; thence along Kings Highway, Bronson Avenue, Barlow's Plains Road and Jennings Road to Bridgeport. The route through Bridgeport is by way of North Avenue and Boston Avenue.

Route 6.—Route 6 passes through the easterly part of The Bronx and the southeasterly part of Westchester County and then continues, largely over a new right-of-way, to and beyond Danbury in Fairfield County. At the Metropolitan Loop it connects with inner Route "f." It passes to the east of the congested parts of Mount Vernon and by-passes to the south and east the central part of White Plains. Lying between radial Route 5 and the Bronx River valley, it would provide a new through traffic route between New York City and points to the northeast. At Danbury it connects with the present trunk line highway to Boston via Springfield.

Beginning on the Metropolitan Loop at East 170th Street and Boston Road in The Bronx the route follows Boston Road, East Tremont Avenue, Morris Park Avenue, White Plains Road and Boston Road to within a few hundred feet of Eastchester Creek; thence a connection is proposed to South Columbus Avenue at South Fulton Avenue in Mount Vernon. The route continues through Mount Vernon on South Columbus Avenue, North Columbus Avenue and the White Plains Road, as far as Fenimore Road in Scarsdale; thence over a proposed new connection to Gambridge Road with an extension thereof to Sterling Avenue in White Plains; thence through White Plains by way of Sterling, Putnam and Bryant Avenues to Mamaroneck Avenue. From this intersection a new connection is proposed to Lake Street at Barnes Lane; thence easterly over existing highways to the Fairfield County line.

The route continues across Fairfield County, principally on a new right-of-way, through Stanwich and Long Ridge; thence across the northeast corner of Westchester County, and reënters Fairfield County to the west of Ridgefield. North of Ridgefield the route joins an existing highway which is followed to Danbury, meeting outer circumferential Route C-2 southwest of that city. This circumferential route is followed south of Danbury to Mountainville Road; thence a new connection is proposed to Triangle Street; thence along Triangle Street, Beaver Brook Road and Newton and Stony Hill Road to the boundary of the Region.

Route 6-B.—Route 6-B utilizes the Hutchinson River Parkway being developed by Westchester County and largely completed in 1928. It extends this parkway route south into New York City over existing boulevards to and through Bronx Park, connecting with radial Route 6 at White Plains Road. It extends the Hutchinson River Parkway to the north through a section of Fairfield County to join radial Route 6 in the northerly part of Greenwich Town. Connecting north of Greenwich Village with a proposed secondary parkway and boulevard, it would form part of a continuous boulevard route between the center of New York City and Bridgeport.

Starting at the intersection of Southern Boulevard and Fordham Road in The Bronx, the route follows Fordham Road, Bronx and Pelham Parkway, Eastern Boulevard and Prospect Avenue through Pelham Bay Park to the Westchester County line; thence a short connection is proposed to the Hutchinson River Parkway. The route then continues on the Hutchinson River Parkway to its terminus at the Fairfield County line; thence by a short new connection north of Glenville to an existing highway; thence along this highway and a new right-of-way to join radial Route 6 just west of Putnam Lake.

Route 7.—This radial route passes approximately through the center of the wedge-shaped area lying between Long Island Sound and the Hudson River. It connects at the Metropolitan Loop with inner Route "e" and utilizes existing highways throughout most of its length. Following the Bronx River valley and then crossing to the valley of the Croton River it provides easy grades and a fairly direct alignment. It serves as the main route between the center of the Region and Pittsfield and other points in the Berkshire Mountains.

Starting from inner Route "e" at the Metropolitan Loop, it crosses The Bronx via Sedgwick Avenue, Fordham Road and Jerome Avenue; thence along Central Avenue in Westchester County to Fulton Street in White Plains; thence on Fulton Street and Kensico Road to a point north of the Old Tarrytown Road, where a connection is proposed across the northerly corner of White Plains to

Broadway. The route continues on Broadway, the highway on the easterly side of Kensico Reservoir, to and through Armonk; thence by the highway passing on the easterly side of Wampus Lake, entering Mount Kisco on Park Avenue; thence through Mount Kisco via Park Avenue, Main Street and the Bedford Road, which is followed to Bedford Hills. At Bedford Hills the route crosses to the highway on the westerly side of the Harlem Division of the New York Central Railroad; thence along this highway, crossing the railroad again north of Katonah; thence northerly over existing highways through Goldens Bridge, Purdy and Croton Falls. It passes south of Brewster and through Sodom, Doansburg and Patterson to the boundary of the Region.

Route 7-B.—Route 7-B utilizes the Bronx River Parkway from Bronx Park in New York City to Kensico Reservoir in Westchester County. It is this parkway which furnished the pattern and incentive for the other parkway routes which are being developed by Westchester County. It is proposed that it be extended to the south via a boulevard route along the Bronx River to a connection with inner Route "b" and the proposed express highway system at the Metropolitan Loop. It intersects radial Route 7 in the northerly part of White Plains and continues northwest over Bronx Parkway Extension to join radial Route 8-B south of Pleasantville.

Beginning on radial Route 7 at East 172d Street and Bronx River Avenue in The Bronx, the route crosses the Bronx River and follows West Farms Road and Boston Road; thence along the southerly and easterly border of Bronx Park to Bronx Park East; thence along Bronx Park East, Bronx Boulevard, Bronx River Parkway and Bronx Parkway Extension, terminating at the Saw Mill River Road at Hawthorne.

Route 8.—The major regional highway nearest to the easterly shore of the Hudson River has been designated radial Route 8. Extending from the Metropolitan Loop at the 178th Street Hudson River Bridge, where it connects with inner Route "a," it parallels the Hudson River to the northerly boundary of the Region and would form the main general traffic route to Albany. From its southerly terminus to a point in North Tarrytown this route is shown as a proposed express highway over or alongside the tracks of the Hudson River Division of the New York Central Railroad. This would both provide a remarkable scenic route with views of the Hudson River and the Palisades on the opposite shore, and also would relieve the congestion upon the Albany Post Road and permit it to function as a much needed local traffic connection between the various communities along the east shore of the Hudson River. North of North Tarrytown the route follows the existing Albany Post Road, except for a proposed by-pass on the west side of Peekskill.

Starting at a point on the Hudson River waterfront in Manhattan opposite 178th Street as a part of the new highway which New York City proposes to build above the New York Central Railroad tracks, the route extends along the waterfront to North Tarrytown where it swings eastward to join the Albany Post Road. Throughout parts of this section it could be located directly on the water's edge, in other parts it might advantageously run just east of the railroad tracks and in certain places it might be on a viaduct above the railroad right-of-way. The route then continues along the Albany

Post Road to Peekskill; thence along South Street, Water Street and an extension thereof on the easterly side of Peekskill Creek, and a new crossing over that creek to rejoin the Albany Post Road. The route then continues along the Post Road to the edge of the Region.

Route 8-B.—Route 8-B will provide a boulevard and parkway route along the east shore of the Hudson River as far north as Peekskill. Within New York City it utilizes the Grand Boulevard and Concourse and throughout Westchester County it utilizes parkways projected and partly completed in 1928 by the Westchester County Park Commission.

Photo by Fairchild Aerial Surveys, Inc.

PRINCIPAL MAJOR HIGHWAY ROUTES IN THE BRONX AND NORTHERN MANHATTAN
The projected Tri-borough Bridge appears in the lower right-hand portion of the picture as a part of Routes "e" and III.

Beginning at East 170th Street and the Grand Boulevard and Concourse in The Bronx the route follows the Concourse and Mosholu Parkway to Van Cortlandt Park where it splits into two proposed secondary routes passing along the east and west edges, respectively, of the park and joining again near the city line. The easterly route through the park is on a new right-of-way parallel to Jerome Avenue, and the westerly route follows the existing highway to a point east of Broadway whence it continues northerly through the park and parallel to Broadway. From the point in the northerly section of Van Cortlandt Park where these routes come together, an extension is proposed (as contemplated by the Westchester County Park Commission) through Tibbetts Brook Park to the Saw Mill River Parkway. The route continues along the Saw Mill River Parkway to Hawthorne; thence along the projected Bronx Parkway Extension to Briarcliff Manor; thence along the projected Briarcliff-Peekskill Parkway, terminating at outer circumferential Route C at the mouth of Peekskill Creek.

Route 9.—The radial route nearest the west shore of the Hudson River is Route 9. This extends from the Metropolitan Loop at the New Jersey approach of the 178th Street Hudson River Bridge to the northerly boundary of the Region and provides a trunk line highway to Albany. It connects at the loop with inner Routes "c" and "d." Within the New Jersey part of the Region this route corresponds to projected State Highway No. 1. Throughout the New York part of the Region it follows existing state highways and provides a scenic route overlooking the Hudson River. It passes through reservations of the Palisades Interstate Park Commission, utilizing the famous Storm King Highway, and also crosses the grounds of the United States Military Academy at West Point. As far north as Sparkill in Rockland County the route forms a part of the proposed express highway system.

Beginning at Lemoine Avenue and the approach to the Hudson River Bridge, in Fort Lee, the route follows Lemoine Avenue and Sylvan Avenue to the neighborhood of Palisades Avenue in Englewood Cliffs; thence along a new right-of-way gradually descending the slope west of the Palisades and through undeveloped and largely wooded country to meet Anderson Avenue at Alpine Road; thence following Anderson Avenue, an extension thereof to the Piermont Road and the latter highway to Sparkill in Rockland County. The route then crosses the Northern Railroad of New Jersey on a viaduct and follows existing highways overlooking the Hudson River through Piermont and Grandview-on-Hudson; thence along Broadway and Hillside Avenue in South Nyack, Highland Avenue in Nyack, and the new state highway on the westerly side of Rockland Lake. Near Waldberg Landing the route crosses to the westerly side of the West Shore Railroad and parallels that railroad through Haverstraw, West Haverstraw, North Haverstraw, Stony Point, Tompkins Cove and Bear Mountain Park to the Orange County line.

In Orange County the route continues through Fort Montgomery, Highland Falls, West Point, Cornwall and New Windsor and passes through Newburgh via Mill Street, Broadway and Liberty Street. It continues north of Newburgh to the limits of the Region, passing through Balmville and Middle Hope.

Route 9-B.—Between the Metropolitan Loop and Sparkill a supplementary boulevard and parkway route has been shown close to the shore of the Hudson River and is designated Route 9-B. This follows existing highways on the tops of the cliffs and its development in the form suggested would do much to preserve and maintain for enjoyment by the public the natural beauties of the Palisades. At several points this route approaches the very edge of the cliffs and furnishes remarkable views of the Hudson River and the country far beyond.

Beginning at the New Jersey end of the Hudson River Bridge the route passes under the bridge approach as a direct continuation of inner Route "c" and follows Hudson Terrace and Sylvan Avenue through Englewood Cliffs, Tenafly, Alpine and Rockleigh into Rockland County; thence continues through Palisades to meet radial Route 9 at Sparkill.

Route 10.—This would supply the need for an intermediate trunk line highway between that along the west shore of the Hudson River and that which passes through the Ramapo Mountains at Suffern. Connecting at the Metropolitan Loop

with inner Route "g," it follows the valley of the Hackensack River and its tributary, Pascack Creek, and continues to the Bear Mountain Reservation of the Palisades Interstate Park Commission. From that point connections would be furnished to radial Route 9 at the Bear Mountain Bridge over the Hudson River, via short sections of radial Route 10-B and outer circumferential Route C.

Starting at the Metropolitan Loop just north of Hackensack the route follows a new right-of-way northerly through Riverside and Oradell to the Kinderkamack Road and along that road to Hillsdale; thence along Robeson Avenue, Grove Street, a connection to and along Stockton Street, and a connection to and along William Street. From William Street in Hillsdale a new connection is proposed to the highway leading north from Montvale; thence along that highway (crossing to the westerly side of the New Jersey & New York Railroad) and an extension thereof to the Rockland County line.

The route through Rockland County is by means of several existing highways and proposed connecting links. It passes on the westerly side of Pearl River and the easterly side of Spring Valley; thence continues through Hempstead, Mount Ivy, Thiells and the valley of Cedar Pond Brook to join radial Route 10-B at the Bear Mountain Reservation of the Palisades Interstate Park.

Route 10-B.—This would provide a much needed parkway and boulevard route connecting the larger communities in Bergen and Passaic Counties with the large recreational areas of the Palisades Interstate Park Commission. Starting from the Metropolitan Loop at Arcola it follows the valley of the Saddle River through Bergen County and into Rockland County. This section of the route presents remarkable possibilities for a parkway development similar to that which has been carried out along the Bronx River in the borough of The Bronx and Westchester County. No intensive development has yet taken place along the shores of the Saddle River and if the necessary property were acquired in the immediate future it should be obtained at reasonable cost. The route would form a new approach to the Bear Mountain Park and passes through a large section of that park.

Beginning at Arcola at the Metropolitan Loop the route follows the Saddle River valley on a new right-of-way as far as Franklin Turnpike in Ridgewood where a connection is made with the East Saddle River Road, which is followed as far as the southerly section of Saddle River Borough; thence westerly for a short distance along an existing highway; thence northerly over a new right-of-way on the east side of the river to rejoin the East Saddle River Road in the center of Saddle River Borough. From this point the route follows the existing highway to Upper Saddle River Borough; thence along a new right-of-way parallel to the river, picking up the existing road again in the northerly section of that borough.

Through Rockland County the route is shown along existing highways through Monsey and Ladentown to the Lake Tiorati Brook Road in the Palisades Interstate Park; thence through the Palisades Interstate Park via Lake Tiorati Brook Road, the road on the westerly side of Stillwater Brook, a new connection to the Beechy Bottom Road and the latter road to the Seven Lakes Drive, where the route terminates on outer circumferential Route C.

Route 11.—Route 11 would serve as the main trunk line highway to the northwest and connects with New York State Highway routes to Binghamton and Buffalo.

From the Metropolitan Loop northeast of Paterson (where connection is furnished to inner Route "k") to a point just south of Suffern it is shown as part of the proposed express highway system. Throughout this section it is designed to relieve the present main highway between Arcola and Suffern which is subject to very severe congestion at times of peak load. North of Suffern the route is mostly over existing highways, connecting with one of the main routes to Newburgh and points north. It crosses outer circumferential Route C at Monroe and proceeds northwest from that point to the boundary of the Region.

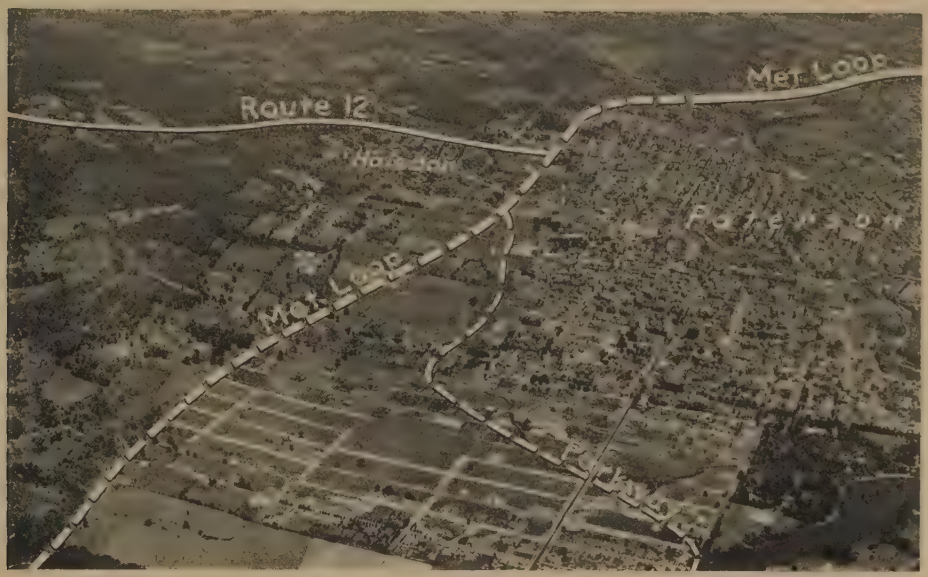


Photo by Fairchild Aerial Surveys, Inc.

PROPOSED HIGHWAYS NORTHWEST OF PATERSON

The Metropolitan Loop forms a by-pass on the north and west around the built-up sections of Paterson.

Beginning at the Metropolitan Loop in Fairlawn, Bergen County, the route extends northerly on a new right-of-way through Glen Rock and Ridgewood to Prospect Street in Midland Park; thence along Prospect Street to Allendale; thence northerly approximately parallel to and from one-quarter to one-half mile west of the Erie Railroad, following existing highways and new connections through Ramsay and Mahwah to a point south of Suffern. The route then crosses the Ramapo River and enters Rockland County on a new right-of-way, by-passing Suffern to the west. It passes through Hillburn along the westerly side of the Ramapo River to Lake Street; thence along Lake Street and the existing highway through Ramapo and Sloatsburg. It continues across Orange County through Tuxedo and Southfields, whence a direct connection is proposed to Monroe, passing about two miles west of Harriman and utilizing an existing road for a portion of the distance; thence along existing highways to a point north of Monroe and then westerly through East Chester to the boundary of the Region.

Route 12.—Route 12 also leads to the northwest but connects with New Jersey State Highways to Port Jervis. It follows existing major highways throughout its length and extends from the Metropolitan Loop just west of Paterson through the Pequannock River valley and through the watershed property therein belonging to the City of Newark.

Starting in Prospect Park, Passaic County, at the intersection of the Metropolitan Loop and Haledon Avenue the route follows Haledon Avenue and the Paterson & Hamburgh Turnpike to Pompton Lakes and thence along the Pequannock River valley through Bloomingdale and Newfoundland to the boundary of the Region.

Route 13.—This route forms the main trunk line highway to the west, connecting with inner Route II and extending from the Metropolitan Loop in Caldwell Town through Dover and Netcong. At the edge of the Region it connects with state highways leading to Delaware Water Gap, Scranton and Buffalo.

Beginning on the Metropolitan Loop where it crosses the Passaic River from Essex County to Passaic County, the route follows Fairfield Road through Caldwell Town southwesterly to Bloomfield Avenue; thence along Bloomfield Avenue and through Pine Brook and Parsippany. It passes through Rockaway via Main Street; thence through Dover along a new street which has been constructed in part of the abandoned Morris Canal bed, McFarlin Avenue and a proposed new crossing of the Rockaway River to West Blackwell Street; thence along that street and Sussex Turnpike to Netcong. In Netcong the route follows the existing highway on the southerly side of the Delaware, Lackawanna & Western Railroad; thence continues southwesterly along the east and south sides of Budd Lake, through Drakestown and leaving the Region at Hackettstown.

Route 13-B.—This is a parkway or boulevard route which follows, throughout most of its length, the abandoned Morris Canal. It is proposed that additional property be acquired adjacent to the former Canal property so as to make possible a parkway route from points in the intensively developed New Jersey suburban areas to Lake Hopatcong and the mountainous areas in that vicinity. Connected at its easterly end with inner Route II, it provides a scenic highway between that route and outer circumferential Route C.

Starting from the Metropolitan Loop north of Little Falls the route follows the abandoned Morris Canal through Mountain View, Lincoln Park and Boonton to Rockaway; thence along Academy Avenue and a new right-of-way to Spicertown; thence over existing highways and new connections to join outer circumferential Route C at Berkshire Valley. Over a short section of the latter route it connects with Lake Hopatcong at Mt. Arlington.

Route 14.—Radial Route 14 forms another main trunk line highway to the west, connecting with inner Route I at the Metropolitan Loop. It follows New Jersey State Highway No. 10 as far as Whippany, then by-passes Morristown on the north and picks up State Highway Route No. 24, which it follows to Long Valley, where it swings northwest and joins radial Route 13 at Hackettstown just outside of the Region.

Beginning at the Metropolitan Loop at a point on Mount Pleasant Avenue west of Livingston in Essex County, the route follows Mount Pleasant Avenue and the Newark-Mount Pleasant Turnpike to Whippany; thence along Whiponong Road, Hanover Avenue and a connection across the northerly section of Morristown to and along Cutler Place; thence over a new connection to and along Washington Road; thence along the existing highway through Mendham (Main Street), Chester (Main Street), Long Valley, Springtown and Schooley Mountain, leaving the limits of the Region at Hackettstown.

Route 15.—This is a new route which would extend from the southwesterly part of the Metropolitan Loop almost due west across the extreme southern tip of Morris County and the northern part of Somerset County, reaching the westerly boundary of the Region at Lamington. At this point it would connect with trunk highways leading to Phillipsburg and Harrisburg. A large part of this route follows existing highways but a considerable number of short new connections are proposed.

Beginning at the Metropolitan Loop at the northerly boundary line of Kenilworth Borough in Union County the route follows Chester Avenue to Turkey Road; thence over a short connection to and along Westfield Avenue and Mountain Avenue through Mountainside and Scotch Plains. In Scotch Plains a new connection is proposed through a gap in First Watchung Mountain to Plainfield Avenue in Watchung Borough; thence the route continues on Plainfield Avenue, Stoney Hill Road, and a connection to Valley Road near Stirling in Morris County. The route passes across the southerly edge of Morris County on Valley Road to the Somerset County line; thence across Somerset County by means of existing highways and several proposed connections passing through Liberty Corner, Far Hills, Bedminster, Greater Crossroads and Lamington to the boundary of the Region.

Route 16.—Route 16 forms a main trunk highway route to the southwest, by-passing most of the larger communities within the suburban area. It provides a route to Philadelphia via Lambertville, connecting with a by-pass around Philadelphia, as proposed by the Regional Planning Federation of the Philadelphia Tri-State District.[1] It starts at circumferential Route A-2 (a supplementary route to the Metropolitan Loop) in the borough of Mountainside in Union County and follows the foot of the southeasterly slope of First Watchung Mountain to Bound Brook and crosses Somerset County to the south of Somerville. A considerable number of new connections are shown between existing highways.

Starting from circumferential Route A-2 in the northeasterly section of Mountainside in Union County, connection is provided via a section of that route with inner Route "h." Route 16 follows a new right-of-way to Mountain Avenue; thence along Mountain Avenue (coinciding for a short distance with radial Route 15) through Scotch Plains and North Plainfield; thence over a short connection to and along Green Brook Road. The route continues, principally along a new right-of-way, in a southwesterly direction through North Plainfield and across the northerly section of Bound Brook; thence between Bound Brook and Somerville, crossing the Lehigh Valley Railroad at South Somerville; thence parallel to and on the southerly side of that railroad to the Amwell Road at Frankfort. The route continues along the Amwell Road, passing through Neshanic, to the boundary of the Region.

[1] By-pass Highways for Traffic Relief, a report by the Highway Committee of the Regional Planning Federation of the Philadelphia Tri-State District, December, 1927.

Route 17.—This route forms a main highway connection to Trenton and Philadelphia, connecting at the Metropolitan Loop with inner Route "g." It is shown throughout its length as part of the proposed express highway system, which it is suggested should extend all the way to Philadelphia. It corresponds to New Jersey State Highway Route No. 25 and follows a new right-of-way throughout a large part of its length.

Beginning in Elizabeth at the Metropolitan Loop and Edgar Road, the route follows Edgar Road (Elizabeth and Linden), Lennington Street (Rahway) and an extension thereof to Hazelwood Avenue; thence along Hazelwood, Leesville and Walnut Avenues, with a short connection to and along China Hill Road. From China Hill Road at Oak Tree Avenue, just east of the Iselin Station of the Pennsylvania Railroad, a new right-of-way is proposed passing on the easterly side of Metuchen and east and south of New Brunswick and meeting Livingston Avenue in North Brunswick Township where it crosses the Pennsylvania Railroad, southwest of New Brunswick. The route follows Livingston Avenue and the highway which is an extension thereof to the boundary of the Region east of Princeton.

Courtesy, Port of New York Authority

OUTERBRIDGE CROSSING, FROM A POINT IN PERTH AMBOY

Route 18.—This route forms a second main highway to Trenton parallel to but east of radial Route 17. Connecting at the Metropolitan Loop with inner Routes "c" and "d," it traverses the westerly part of the borough of Richmond, crosses the Arthur Kill and Raritan River and passes through the easterly part of Middlesex County. Within the borough of Richmond it is mostly over a new right-of-way but through New Jersey it is shown almost entirely over existing highways.

Beginning in the northerly part of the borough of Richmond at Forest Avenue near Morningstar Road the route extends southerly by a new connection (utilizing in part a mapped section of Morningstar Road) to Victory Boulevard (Richmond Turnpike); thence along Victory Boulevard to a point north of Linoleumville. A new highway is proposed from this point across the meadows and along the shore of Arthur Kill to the Outerbridge Crossing (Tottenville-Perth Amboy Bridge); thence the route crosses the Arthur Kill, via that bridge, to Perth Amboy. In Perth Amboy the route continues westerly

along Lawrence or Grove Street and Waltrous Lane, meeting outer circumferential Route B at Cleveland Street.

Route 18 follows Route B southerly through Perth Amboy, across the Raritan River and west of South Amboy. It then swings southwest along Main Street and continues through Middlesex County along existing highways and several short new connections, paralleling the Amboy Division of the Pennsylvania Railroad and passing through Ernston, Old Bridge and Helmetta, on the north and west sides of Jamesburg, and through Prospect Plains and Cranbury Station to the southerly boundary of the Region.

Route 19.—A main highway connection between the center of the Region and the Atlantic City section of New Jersey is designated radial Route 19. Starting at the Metropolitan Loop in the easterly part of the borough of Richmond, it passes through that borough and utilizes the same crossings over Arthur Kill and Raritan River as does radial Route 18. From South Amboy it proceeds almost due south and mostly over existing highways to the southerly boundary of the Region.

Starting at the intersection of Hylan Boulevard and Sand Lane in the borough of Richmond the route follows Hylan Boulevard to a point north of Great Kills; thence along a new connection to Amboy Road; thence along Amboy Road to Poillon Avenue. From this point a new right-of-way (as proposed by the City of New York) is shown to the Outerbridge Crossing (Perth Amboy-Tottenville Bridge), running parallel to and on the southerly side of the Staten Island Railroad to a point west of Pleasant Plains, where it crosses the railroad and extends to the bridge approach.

Joining radial Route 18, the route then passes over the Outerbridge Crossing to Perth Amboy, and along outer circumferential Route B over the Raritan River and west of South Amboy. Leaving Route 18 on Main Street southwest of South Amboy Route 19 follows the existing highway through Cheesequake and Morristown (Middlesex County); thence by a short connection to and along the highway to Matawan. The route proceeds on existing highways on the south side of Matawan and through Morganville, Wickatunk, Marlboro and Freehold (via Broadway and South Street); thence over a short new connection south of Freehold to and along the existing highway through Southard to the southerly boundary of the Region at a point just north of Lakewood.

Route 20.—Route 20 passes through the easterly part of Monmouth County and would serve the many shore communities along this part of the Atlantic Coast. Starting from outer circumferential Route B near Keyport it follows existing highways and connects at the southerly boundary of the Region with highways leading to Point Pleasant and south along the narrow peninsula between Barnegat Bay and the Atlantic Ocean.

Beginning at outer circumferential Route B at the southerly boundary line of Keyport in Monmouth County the route follows the existing highway to Middletown; thence along the Red Bank and Middletown Turnpike to Red Bank. It continues southerly through Red Bank (Shrewsbury Avenue) and Eatontown (Front Street); thence easterly through West Long Branch; thence southerly on Locust Avenue through Oakhurst to Deal Park; thence over a short new connection to and along Wickapecko Drive on the west of Interlaken. The route continues along existing highways through Asbury Park (Ridge Avenue), Neptune City, Avon-by-the-Sea (Sylvania Avenue and Main Street) and Belmar (River Avenue and H Street); thence along the westerly sides of South Belmar, Spring Lake and Sea Girt to and through Manasquan (Broad Street); thence over a new connection to the existing bridge over the Manasquan River, which forms the southerly boundary of the Region at this point.

Outer Circumferential Routes

The outer circumferential routes shown on the Graphic Regional Plan lie between the Metropolitan Loop and the edges of the Region. From a traffic point of view they are less important than the radial routes. They are, however, of sufficient importance to be classed among the major regional routes. It is expected that they will be used primarily for intercommunication between the various communities in the outer parts of the Region, to some extent as by-passes around the central areas, and to a considerable extent as pleasure routes for that week-end motor traffic which is responsible for the most widespread highway congestion. Supplementary outer circumferential routes are shown in certain parts of the Region.

The routes are described below in a clockwise direction, starting at the Atlantic Coast in Monmouth County and swinging west, north and east until they reach the north shore of Long Island Sound. Where a route has a corresponding section across Long Island this is described as a continuation in the same clockwise direction of the mainland part of the route, although its importance is largely limited to its usefulness in the Long Island highway system.

There are two principal outer circumferential routes designated as Routes B and C, respectively, and three supplementary routes.

Route B.—Route B passes approximately around the outer edges of the principal suburban communities and connects many of the important sub-centers of the Region. It is important that such a route should be planned and provided for before the outward spread of suburban development offers obstacles to its construction. Starting near the base of Sandy Hook in Monmouth County the route skirts the south shore of Lower New York Bay, passes over the First and Second Watchung Mountains northwest of Plainfield and down the westerly side of the upper Passaic River valley. It swings to the east around the north end of First Watchung Mountain, crosses the Saddle River valley north of Ridgewood, cuts across the upper end of the Oradell Reservoir on the Hackensack River, enters New York State via the Yonkers-Alpine Ferry and utilizes the Cross County Parkway in southern Westchester County. In Long Island it furnishes a circumferential route through approximately the center of Nassau County. A more detailed description of the route shown is given below.

In Monmouth.—Beginning at Highlands in Monmouth County the route follows Navesink Avenue and Bayview Avenue to First Avenue in Atlantic Highlands, where a short connection is proposed to and along Center Avenue; thence by a new connection across the marsh lands adjacent to Ware Creek to Shore Road; thence along existing highways through Port Monmouth, Keansburg, Mechanicsville, the southwesterly section of Keyport and Cliffwood to the Middlesex County line.

In Middlesex, Union and Somerset.—In Middlesex County the route continues on existing highways to the boundary of South Amboy; thence by-passes that city by new connections on the south and west and crosses the Raritan River via the Victory Bridge; thence through Perth Amboy via Fox Hill Road, Convery Place, Cleveland Avenue and Waltrous Lane. From Perth Amboy to a point east of South Plainfield the route parallels the proposed outer belt railroad and is mostly over a new right-of-way

through open country, passing through the northeasterly section of Metuchen. It joins an existing highway in South Plainfield and crosses the westerly end of Union County via Park Avenue and Somerset Street in Plainfield; thence it crosses a corner of Somerset County along Somerset Street in North Plainfield and existing highways in Watchung Borough and Warren Township.

In Morris.—Continuing through the easterly part of Morris County, the route is largely over a new right-of-way in open country but utilizes several sections of existing highways. It passes through Passaic and Harding Townships; thence through Morris Township (by-passing Morristown on the east) via James Street, a new connection to and along Glen Road and a second new connection; thence through Hanover Township via Malapardis and Parsippany and along the easterly side of Boonton Reservoir; thence through Montville Township, Lincoln Park Borough and Pequannock Township.

In Passaic and Bergen.—The route enters Passaic County at Pompton Lakes Borough and passes through that borough and a corner of Wayne Township along Pompton Plains Road and Oakland Road; thence it enters Bergen County and continues along the same highway to Oakland; thence it swings easterly along Oakland Avenue, Campgaw Road, Franklin Avenue and Wyckoff Road to Franklin Turnpike in Waldwick Borough; thence by a short connection to and along Waldwick Road. At the West Saddle River Road a new connection is proposed to and along the highway which is the boundary between Hohokus and Saddle River; thence a short connection is proposed to Hillsdale Avenue in Hillsdale; thence the route continues along Hillsdale Avenue to Pascack Brook; thence over a new connection following the general direction of Pascack Brook to Old Hook Road at Brookside Road; thence following Old Hook Road and an extension thereof to and along Closter Dock or Alpine Road, to reach the Hudson River at Alpine.

In Westchester.—The Hudson River is crossed by the existing Yonkers-Alpine ferry, the capacity of which should be increased as the volume of traffic warrants it. Route B then crosses Westchester County from Yonkers to New Rochelle, following throughout most of this section the Cross County Parkway being constructed by the county Park Commission. Along this parkway both a major general highway and a secondary parkway are shown, indicating that separate facilities should be provided for general traffic and for a link in the county park system. From the Yonkers ferry terminal the route follows Main Street, Palisade Avenue, Elm Street, Nepperhan Avenue and Yonkers Avenue to the projected Cross County Parkway; thence along that parkway through the northerly parts of Mount Vernon and North Pelham to Coligni Avenue in New Rochelle; thence along Coligni Avenue, Fifth Avenue, Slocum Street, Hamilton Avenue and the Boulevard to the projected Pelham-Port Chester Parkway.

On Long Island.—That part of Route B which is on Long Island crosses Nassau County from Glen Cove to Long Beach. It follows Glen Cove Road and Guinna Town Road; thence over a short cut-off just south of Jericho Turnpike to and along Glen Cove Road and Clinton Road; thence through Hempstead by way of Clinton Avenue and Henry Street; thence along Grand Avenue, Oceanside Avenue and Long Beach Road (Rockville Center) to Island Park; thence by way of the Boulevard and Long Beach Boulevard, terminating at the Boardwalk in Long Beach.

Route B-1.—Route B-1 is a boulevard and parkway route which starts in Long Branch several miles south of the beginning of Route B and joins the latter north of Plainfield. Connecting at New Brunswick with the express highway system it provides an attractive and speedy passenger car route between that point and the New Jersey shore resorts, following watercourses which lend themselves admirably to park treatment. From New Brunswick it follows the north shore of the Raritan River to Bound Brook and then swings northeasterly along the foot of First Watchung

Mountain to join Route B, where it also connects with a proposed parkway that continues northeasterly along the Watchung Mountains to Paterson.[1]

Starting near the oceanfront in Long Branch the route is practically all over a new right-of-way to Highland Park in Middlesex County. It extends westerly along Whale Pond Brook and Cranberry Brook; thence turns northwesterly to Tinton Falls; thence along the general direction of Hop Brook, Willow Brook, Tennent Brook and South River to a point east of New Brunswick, where it crosses the Raritan River (co-extensive with radial Route 17) and follows the north bank of that river to Highland Park. From that point it follows the existing highway on the northerly side of the Raritan River to Bound Brook; thence it proceeds northerly through the easterly part of Bound Brook, ascends First Watchung Mountain to Washington Rock, and then descends that mountain to join outer circumferential Route B at Somerset Street in North Plainfield, Somerset County.

Route C.—This circumferential route is located near the outer limits of the Region. Much of it is a scenic route through hilly country and would form an important adjunct to the park and parkway system. That part of it between Lake Hopatcong and the north end of Greenwood Lake is shown as a proposed parkway along the slopes of Green Pond Mountain and Bearfort Mountain. Through Bear Mountain Park and across Westchester County it also forms part of the proposed parkway system.

Starting just south of Asbury Park in Monmouth County, this route passes around the westerly end of the Watchung Mountains and through the hilly sections in the western parts of Morris and Passaic Counties, skirting the shores of both Lake Hopatcong and Greenwood Lake. It crosses the Hudson River over the Bear Mountain Bridge and reaches Long Island Sound at Stamford. Across Long Island it passes through the extreme westerly part of Suffolk County. Route C is almost entirely along existing highways, with several short connections for improved alignment.

Atlantic Coast to Lake Hopatcong.—Beginning at Main Street in Ocean Grove, Monmouth County, the route proceeds westerly along Corlies Avenue and other existing highways until it crosses the New Jersey Southern Division of the Central Railroad of New Jersey; thence over a new right-of-way to Freehold, by-passing its business center on the south; thence northwest through Englishtown to Jamesburg in Middlesex County; thence westerly through Dayton, Monmouth Junction and Kingston. For a short distance it then passes through Mercer County, just outside of the Region, following the highway from Kingston to Rocky Hill. The route swings northerly across Somerset County, passing through Rocky Hill, Belle Mead, South Somerville, Somerville, Pluckemin, Bedminster and Peapack-Gladstone. It continues northerly through Morris County via Chester and Flanders to Netcong; thence northeasterly and following the east shore of Lake Hopatcong to Mount Arlington.

Lake Hopatcong to Greenwood Lake.—At this point the route becomes a proposed parkway, passing easterly through Berkshire Valley and northeast along the existing highway through Longwood Valley, entering Passaic County between Oak Ridge and Newfoundland; thence across West Milford Township along Oak Ridge Road, Paterson & Hamburgh Turnpike (radial Route 12), Larue Road and Union Valley Road; thence by a connection on the westerly side of Belcher Creek to and along Lakeside Road;

[1] See parkway and boulevard routes Nos. 2 and 3, pages 274–275.

thence along the west shore of Greenwood Lake to Greenwood Lake Village in Orange County, where connection is made with a secondary boulevard swinging to the east.

Greenwood Lake to Hudson River.—Route C by-passes the center of Greenwood Lake Village to the north by a new connection and continues northwest along the existing highway to Monroe; thence it swings easterly to and along the Central Valley Road, with short new connections to avoid the centers of Monroe, Harriman and Central Valley; thence through the Palisades Interstate Park to Bear Mountain Bridge by way of Long Mountain Road, a short section of Seven Lakes Drive and the recently constructed highway on the north side of Bear Mountain.

Hudson River to Long Island Sound.—Crossing the Hudson River by the Bear Mountain Bridge, the route continues easterly as part of a proposed parkway across Westchester County. It follows the existing state highway along the Hudson River to Peekskill Creek; thence along the projected Bronx Parkway Extension (completed in 1928 across Peekskill Creek and east to the Albany Post Road) to Mohansic Park; thence through the park on the existing highway on the south side of Mohansic Lake and an extension to and along the highway from the southerly end of Muscoot Reservoir to Katonah. At Katonah the route turns north to cross an arm of the Croton Reservoir; thence continues easterly along the reservoir for about one-half mile.

The proposed parkway continues east from this point, but Route C swings southeast over the existing highway to and through Bedford. Continuing along existing highways it crosses Fairfield County through Long Ridge and Lockwood and along a section of the Rippowam River; thence through Stamford via Summer Street, terminating at Main Street (Boston Post Road).

On Long Island.—The Long Island section of Route C is approximately parallel to the Nassau-Suffolk County line and follows existing highways from Huntington, through Melville and east of Farmingdale, to radial Route 1 at a point between Massapequa and Amityville. Starting at Main Street in Huntington it follows New York Avenue, Huntington Avenue, Huntington Road, Hollow Road and Broadway to a point near Carman Creek; thence it crosses into Nassau County as a proposed parkway on the easterly side of the creek, terminating at Conduit Boulevard.

Route C-1.—This supplements the northerly part of outer circumferential Route C by providing an intermediate route between it and Route B. Branching off Route C south of Greenwood Lake it passes through Rockland County, crosses to Westchester County via an existing ferry and reaches Long Island Sound at Port Chester. In Westchester County it connects up those communities suggested as the termini of the proposed suburban rapid transit routes and gives them ready access to the New Jersey part of the Region.

Branching off outer circumferential Route C on Union Valley Road in West Milford, Passaic County, the route swings easterly to Ringwood along Marshall Hill Road, Midvale & Greenwood Lake Road and Hewitt & Ringwood Road; thence along the existing highway, with proposed realignment, across the south corner of Orange County to Sloatsburg in Rockland County. The route continues easterly across Rockland County along the existing highway through Ramapo to Suffern; thence by a new connection to pass north of the center of Suffern and along the existing highway through Tallman and Monsey; thence by a new connection it passes south of Spring Valley and follows the existing highway north of Nanuet and through Clarksville and West Nyack; thence to and along Main Street in Nyack to cross the Hudson River by the Tarrytown-Nyack Ferry.

The route crosses Westchester County in a southeast direction. It passes through Tarrytown along Main Street, South Orchard Street, Franklin Street, Broadway and White Plains Road; thence along the

latter road to Elmsford; thence along Tarrytown Road to White Plains; thence through White Plains along Central Park Avenue, Main Street (or Hamilton Avenue to by-pass the main business street) and Westchester Avenue; thence continues along Westchester Avenue to and through Port Chester, terminating at the projected Pelham-Port Chester Parkway.

Route C-2.—Route C-2 supplements outer circumferential Route C by providing a route farther north in the northerly part of the Region. Branching off Route C at Central Valley in Orange County, it crosses the Hudson River via the existing ferry from Newburgh to Beacon and reaches Long Island Sound at Bridgeport. The Long Island section of this route passes through the central part of Suffolk County.

Branching off outer circumferential Route C south of Central Valley in Orange County, the route follows the existing state highway northerly through Central Valley, Highland Mills, Mountainville and Vailsgate; thence through Newburgh by way of Lake Street, Broadway, Colden Street and Second Street to cross the Hudson River by the existing ferry to Beacon.

It crosses the southwest corner of Dutchess County, passing through Beacon along Ferry Street, Main Street and Fishkill Avenue; thence through Fishkill Village along Main Street and Hopewell Avenue; thence across East Fishkill Town, turning south along one of the valleys in the Fishkill Mountains into Putnam County at Hortontown; thence by existing roads and proposed connections to and along the highway on the west side of Boyd Corners Reservoir; thence along existing highways through Carmel and Brewster; thence easterly on the existing highway on the southerly side of the East Branch Reservoir to the Fairfield County line.

In Fairfield County the route continues easterly toward Danbury, by-passing that city on the south by short new connections between sections of Seger Street, Backus Avenue and Southern Boulevard. Near the southeast corner of Danbury it joins Connecticut State Highway Route No. 124 which is followed through Bethel and Redding Ridge, along the westerly sides of Aspetuck and Hemlock Reservoirs and along Blackrock Turnpike, to radial Route 5 at Jennings Road in Fairfield Town.

The section of Route C-2 on Long Island begins at Port Jefferson, follows the existing highway through Coram and Medford and continues on Medford Road and Medford Avenue to terminate on radial Route 1 at the Montauk Highway in Patchogue.

Metropolitan By-pass

There has been indicated in Fig. 12 (page 219) certain routes which have been called parts of a Metropolitan By-pass. These utilize certain sections of the routes which have already been described and some other major regional routes the locations of which are indicated in the detailed description below.

It is expected that there will be a considerable amount of long-haul vehicular traffic which is routed through the New York region. At the present time practically all such vehicles pass through the central congested areas. The Metropolitan By-pass would offer a convenient by-pass around all that area which is or is likely to become intensively developed, and would also avoid the built-up areas in all the larger communities within those outer areas through which it passes. The demand for such a route would be primarily for traffic moving between points southwest and northeast, respectively, of New York and its environs. To serve this purpose a route

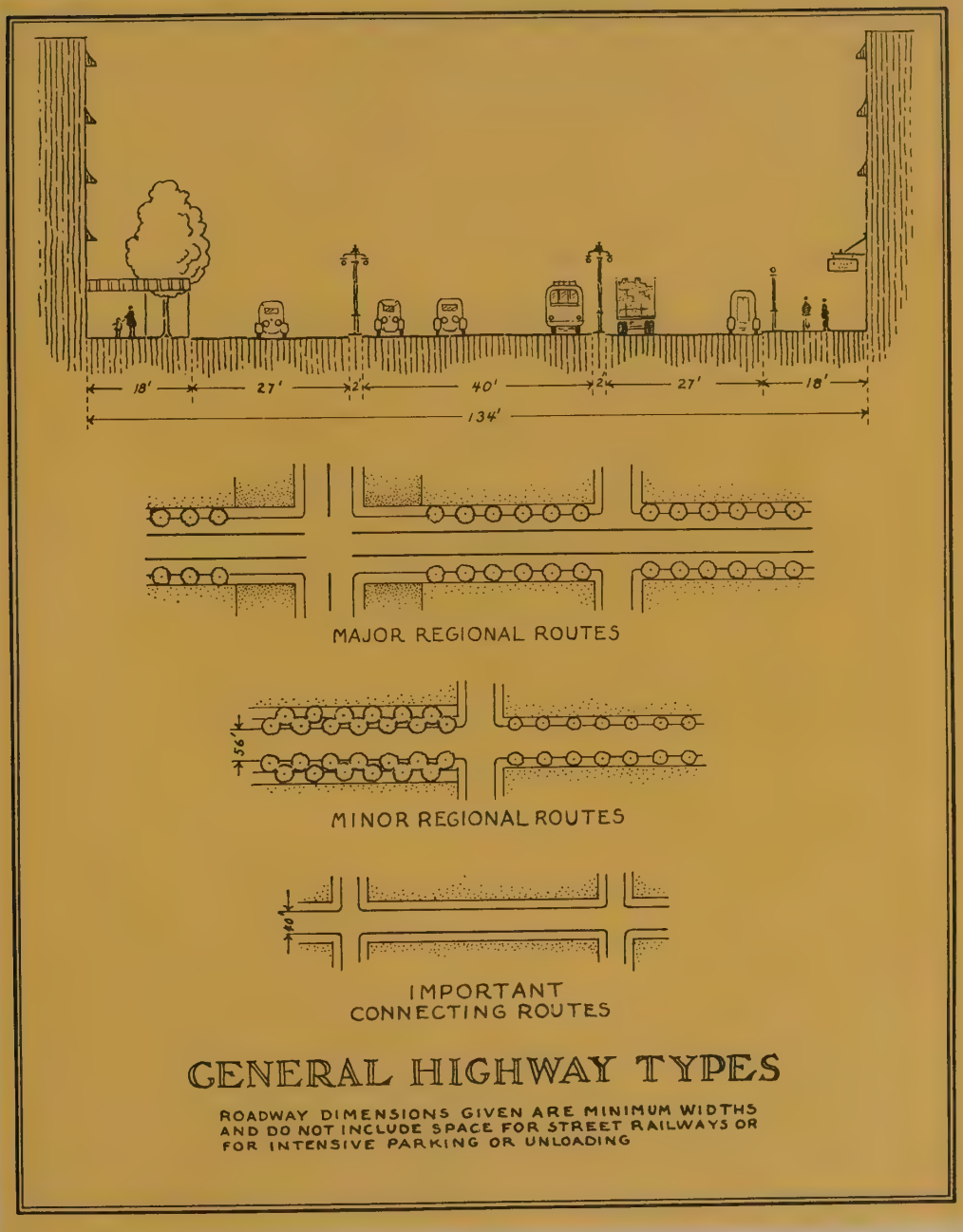

18'
27'
2'
40'
2'
27'
18'
134'
MAJOR REGIONAL ROUTES
56'
MINOR REGIONAL ROUTES
40'
IMPORTANT
CONNECTING ROUTES
GENERAL HIGHWAY TYPES
ROADWAY DIMENSIONS GIVEN ARE MINIMUM WIDTHS
AND DO NOT INCLUDE SPACE FOR STREET RAILWAYS OR
FOR INTENSIVE PARKING OR UNLOADING

FIG. 16

is indicated which would start at the boundary of the Region in the southwest part of Somerset County and traverse New Jersey through or near the following communities: Neshanic, South Somerville, Somerville, Pluckemin, Bedminster, Far Hills, Bernardsville, Morristown, Parsippany, Pompton Lakes, Oakland and Darlington.

In New York State the route passes on the east side of Suffern and through the Bear Mountain Reservation of the Palisades Interstate Park. At the west shore of the Hudson River it splits into two branches. That for traffic to or from the north would pass along the westerly shore of the Hudson River; that for traffic to or from the

Courtesy, Westchester County Park Commission

PEEKSKILL CREEK CROSSING

Constructed as a part of Bronx Parkway Extension, it also forms part of the Metropolitan By-pass.

northeast would cross the Bear Mountain Bridge and traverse Westchester County through Peekskill, Yorktown Heights, Amawalk, Katonah, Cross River and Bouton-ville.

After entering Fairfield County, Connecticut, the route again splits into two branches. The northerly one passes to the north of Ridgefield and through the southerly and easterly parts of Danbury, leaving the Region to the east of that city via the main trunk highway to Springfield and Boston. The southerly one passes south of Ridgefield, through Branchville, north of Georgetown and continues via the Blackrock Turnpike and Jennings Road to Bridgeport. Passing through Bridgeport via North and Boston Avenues it connects with the main trunk highway to Boston via New Haven. Where the Metropolitan By-pass follows routes already described the details are not repeated in the following description.

Starting near the southwest corner of the Region the route follows radial Route 16 to the vicinity of South Somerville; thence northerly along outer circumferential Route C to radial Route 15 at Bedminster; thence northeasterly along an existing highway to the vicinity of Morristown; thence over a short connection to outer circumferential Route B; thence along Route B to Oakland in Bergen County. From Oakland the route follows the existing highway on the easterly side of the Ramapo Mountains (with a proposed new connection to by-pass Suffern on the east) to Ladentown in Rockland County;

Courtesy, New Jersey State Highway Commission

EXPRESS HIGHWAY IN JERSEY CITY AS HOLLAND TUNNEL APPROACH

Built by the State of New Jersey. The central depressed roadway was opened in December, 1928.

thence along radial Route 10-B to Seven Lakes Drive in Bear Mountain Park; thence along outer circumferential Route C to the Bear Mountain Bridge.

The branch of the Metropolitan By-pass to the north follows radial Route 9 northerly from its intersection with Route C to the edge of the Region. The main route continues along outer circumferential Route C across the Bear Mountain Bridge to Katonah; thence easterly along existing highways and several new connections to radial Route 6 west of Ridgefield in Fairfield County. From this point an inland route in Connecticut follows Route 6 northeasterly to the boundary of the Region. A southerly route follows existing and proposed highways to join outer circumferential Route C-2 at the Aspetuck River in the Town of Easton; thence along Route C-2 to Bridgeport; thence along radial Route 5 to the boundary of the Region.

Express Highways

The system of express highways included in the Graphic Regional Plan has already been referred to in the preceding descriptions of routes, where reference has been made to those sections which are proposed as express highways. As far as possible

Photo by Fairchild Aerial Surveys, Inc.

AIRPLANE VIEW OF PROPOSED EXPRESS HIGHWAYS, LOOKING NORTH FROM A POINT OVER JERSEY CITY

express routes should skirt the edges of intensive development, but the central area of congestion in New York and its environs has become so large that any comprehensive system of express roads must cross that area. The proposed express highways have been shown in Fig. 17, where the various sections have been designated by the route numbers used in the preceding description, which has covered all parts of the express system.

Along the routes indicated a greater efficiency of traffic movement is more important than a mere increase in the number of vehicles which can be accommodated. The most effective gain in efficiency can be obtained by permitting an approximately uninterrupted traffic flow. There is little to be gained by increasing roadway widths, and thus theoretically providing for more vehicles, if frequent traffic delays at intersecting thoroughfares prevent these vehicles from movement along the widened roadway. Also, it has been proved that added roadway space in central areas attracts additional vehicles as soon as opened and the old congestion still remains unless the widening has been linked with a comprehensive plan of improvements designed to relieve the real causes of the congestion.

Uninterrupted movement requires the separation of grades at all important highway crossings and the elimination, so far as possible, of any interference from traffic turning to or from the express road. Through intensively built-up areas this can only be accomplished by placing the express route on a viaduct above the existing street system or in tunnel or open cut below the existing streets. In more open country the express roadway can be kept on the surface and the principal intersecting highways carried either over or under it. Types of suggested treatment are illustrated in Fig. 18 (page 268).

Courtesy, New Jersey State Highway Commission

EXPRESS HIGHWAY THROUGH NEWARK, NEW JERSEY

The view shows a ramp connection east from Wilson Avenue. This section was opened to traffic in December, 1928, and forms part of inner Route "g."

The New York region already has an excellent example of an express highway in the New Jersey State Highway Route No. 25 which is now being constructed between Elizabeth and the New Jersey approach to the Holland Tunnel under the Hudson River. The projected elevated highway along the west waterfront of Manhattan between Canal Street and 72d Street, as approved by the Board of Estimate and Apportionment in New York City in 1928, will provide an example of a somewhat different type of express route.

As the detailed locations of the suggested express highways can be found by reference to sections of the preceding descriptions of the inner, radial and circumferential routes, it is sufficient at this point to describe the various sections of the system as parts of such routes. The express highways are grouped below into three primarily east and west routes and five primarily north and south routes.

East and West Routes

(1) From Newark, across southern Manhattan and along the south shore of Long Island. This follows inner Route I from the easterly section of Newark to its easterly terminus near the Rockaway Beach Division of the Long Island Railroad; thence along a section of the Metropolitan Loop (Route A) to Springfield Boulevard; thence along radial Route 1 to a point just west of the Nassau-Suffolk County line.

(2) From the west side of the Hackensack meadows across midtown Manhattan to Long Island City in the borough of Queens. This follows inner Route II from its intersection with inner Route "g" to the eastern end of a proposed vehicular tunnel under the East River.

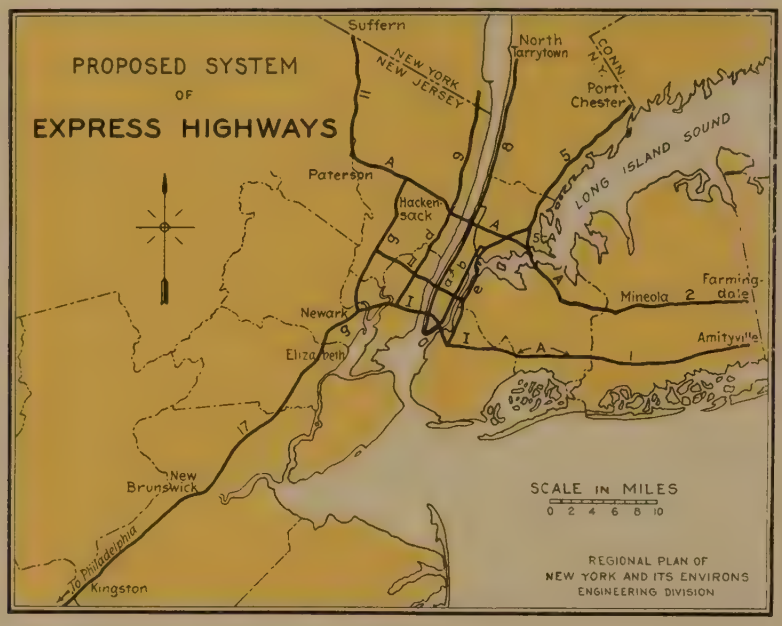


FIG. 17

(3) From the center of Bergen County across the Washington Heights section of Manhattan and the borough of The Bronx and through the central portion of Long Island. This follows the Metropolitan Loop (Route A) from a point north of Hackensack to its intersection with the old Stewart Railroad right-of-way in the borough of Queens; thence along radial Route 2 to Farmingdale.

North and South Routes

(4) Through the New Jersey part of the Region from its southerly boundary through the metropolitan area to the north edge of Bergen County. This utilizes all of radial Route 17 from the edge of the Region to Elizabeth; thence follows the full length of inner Route "g" to a point north of Hackensack, connecting with all three east and west express highways, in Newark, on the west side of the Hackensack meadows and north of Hackensack, respectively; thence along the Metropolitan Loop (Route A) to a point northeast of Paterson; thence along radial Route 11 to a point just south of Suffern.

(5) Near the west shore of the Hudson River—but mostly in back of the ridge which forms the Palisades—from Jersey City to the southeast corner of Rockland County. This follows inner Route "d" from inner Route I (an east and west express highway at this point) to Fort Lee, intersecting east

Courtesy, Commissioner of Highways, New York State

CONDUIT BOULEVARD, PROPOSED AS AN EXPRESS HIGHWAY

View to the left was taken near Baldwin; that to the right, at Wantagh. The roadway was opened to traffic in 1928.

Courtesy, Consulting Engineer, Borough of Brooklyn

ATLANTIC AVENUE AT THE EAST NEW YORK STATION OF THE LONG ISLAND RAILROAD

It is obvious that the need for planning is acute. An express highway is proposed for this part of Atlantic Avenue.

and west express highways in North Bergen Township and in Fort Lee; thence easterly over a short section of the Metropolitan Loop (Route A) to Lemoine Avenue; thence along radial Route 9 to Sparkill.

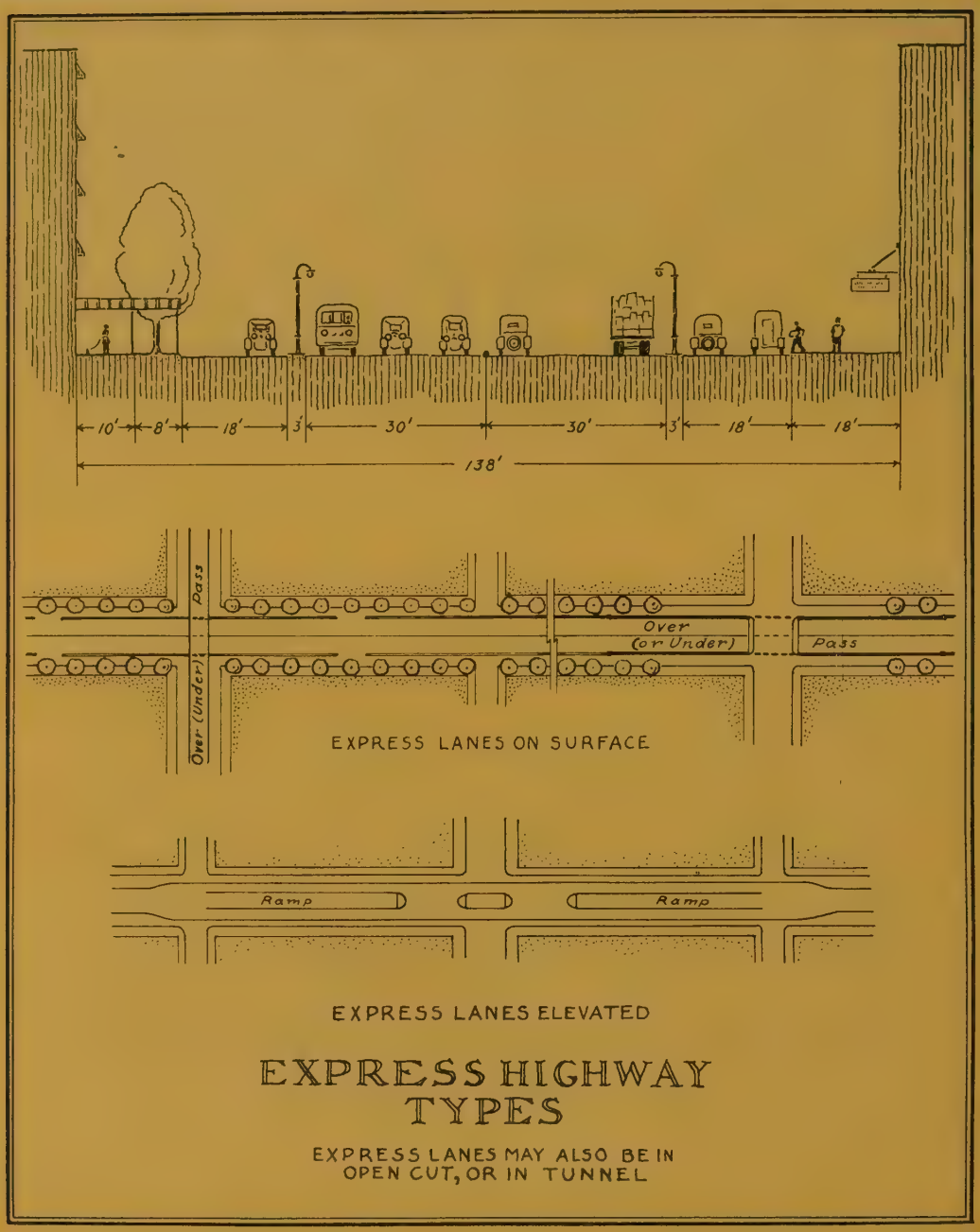

10'
8'
18'
3'
30'
30'
3'
18'
18'
138'
Pass
Over (Under)
Over
(or Under)
Pass
EXPRESS LANES ON SURFACE
Ramp
Ramp
EXPRESS LANES ELEVATED
EXPRESS HIGHWAY TYPES
EXPRESS LANES MAY ALSO BE IN OPEN CUT, OR IN TUNNEL

FIG. 18

(6) Along the east shore of the Hudson River from the south end of Manhattan to North Tarrytown. This follows inner Route "a" to the Hudson River Bridge, connecting with all three east and west express highways; thence along radial Route 8 to North Tarrytown.

(7) Along the East River waterfront of Manhattan and parallel to the north shore of Long Island Sound to Port Chester. This follows inner Route "b" from the south end of Manhattan to the vicinity of Westchester Avenue in The Bronx, connecting with all three east and west express highways; thence along radial Route 5 to Port Chester. It also includes a connection with the proposed Old Ferry Point-Whitestone crossing of the East River via supplementary radial Route 5-A.

(8) A Brooklyn-Queens crosstown route parallel to the East River and crossing to The Bronx via the projected Tri-borough Bridge. This follows inner Route "e" from Atlantic Avenue in Brooklyn to join the preceding express highway at the Bronx approach to the Tri-borough Bridge.

Parkways and Boulevards

Their Place in the Highway System.—Up to this point major consideration has been given to those routes that conform to the regular type of vehicular highway, and separate boulevard or parkway routes have been referred to as supplementary. As commonly regarded, and as defined under highway law, an ordinary highway is predominantly a public right-of-way for all classes of traffic with a public right of access to and from the land which abuts it on both sides. It has been shown that the Region possesses a fairly complete system of such highways and that the most extensive program of highway improvement that needs to be carried out is to widen and straighten these and to eliminate their bad grades. The proposed regional system of general highways includes, however, special new types such as the express highways described above. New features are also suggested, such as the combination of a highway artery with other forms of transportation facilities in the corridor designated as the "Metropolitan Loop."

The parkways and boulevards are of such importance that it is desirable to describe them as a complete regional system, even though this entails a certain amount of repetition. This system is shown in Fig. 20 (page 273) and its relation to the proposed regional park system is indicated on Pocket Map No. 4 at the back of this volume. Some reference to its various parts will also be found in the description of the park system in the chapter dealing with Land Uses.[1]

A general definition of these two types of highways has already been given.[2] From a legal point of view there is a very definite distinction between them. The parkway is a park and road combined, with a special legal quality that denies right of access to it from abutting land. A boulevard is a highway that is furnished with trees, grass or other landscape features, but to which right of access from abutting private property is not denied.

The parkway serves a great variety of communication and recreation uses which cannot be obtained in ordinary highways. It provides special ways for passenger

[1] See pages 336–355.

[2] See page 217.

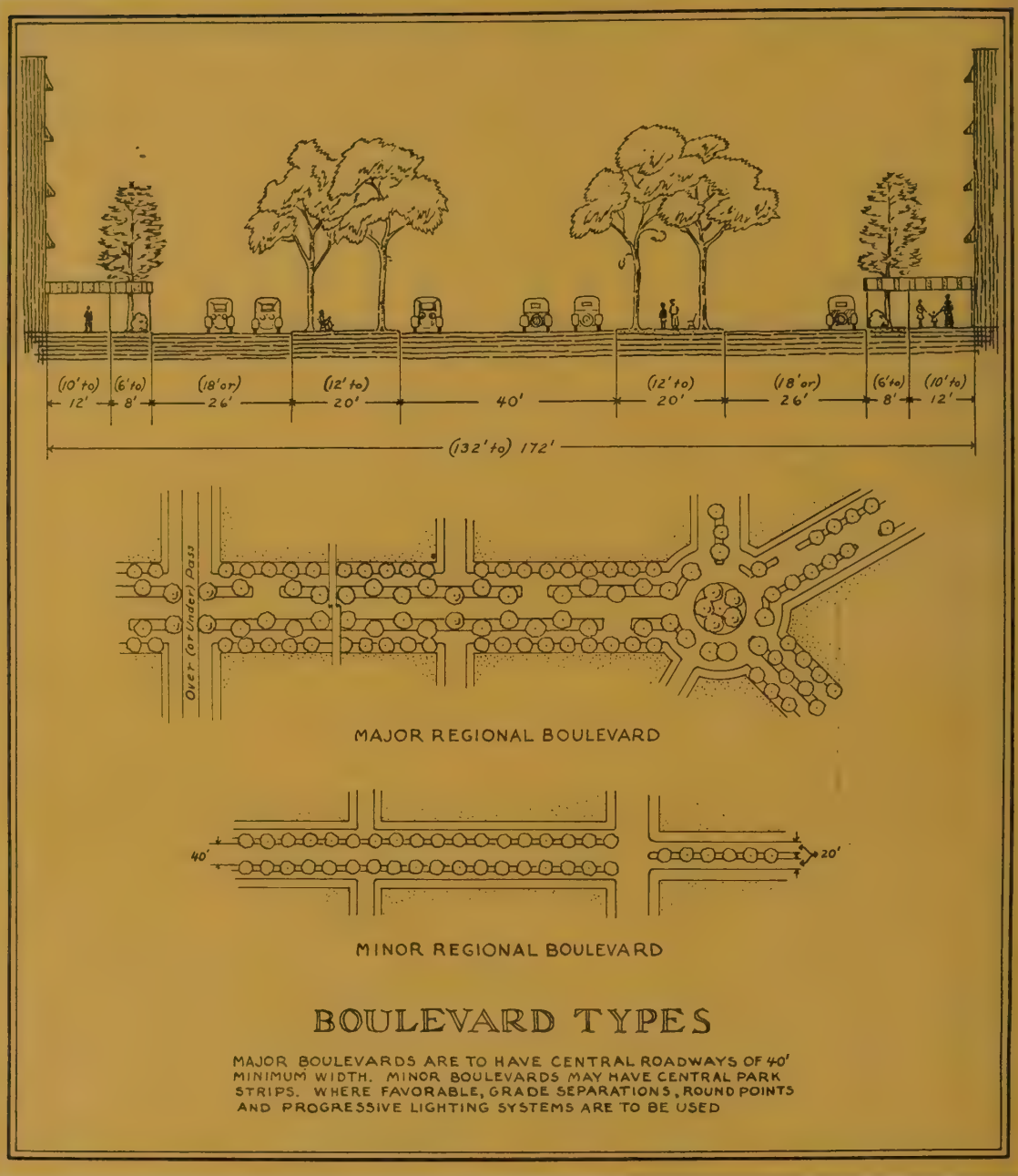

(10' to) 12'
(6' to) 8'
(18' or) 26'
(12' to) 20'
40'
(12' to) 20'
(18' or) 26'
(6' to) 8'
(10' to) 12'
(132' to) 172'
Over (or Under) Pass
MAJOR REGIONAL BOULEVARD
40'
20'
MINOR REGIONAL BOULEVARD
BOULEVARD TYPES
MAJOR BOULEVARDS ARE TO HAVE CENTRAL ROADWAYS OF 40' MINIMUM WIDTH. MINOR BOULEVARDS MAY HAVE CENTRAL PARK STRIPS. WHERE FAVORABLE, GRADE SEPARATIONS, ROUND POINTS AND PROGRESSIVE LIGHTING SYSTEMS ARE TO BE USED

FIG. 19

cars, which greatly facilitate the speed of these vehicles and relieve traffic congestion on those highways serving other forms of vehicular traffic. It is the best type of way for promoting a permanent residential development. It provides special paths for riding and walking and immediate access to open areas for picnicking, rest and play; although these are recreational features they are supplementary facilities to the larger ways of communication.

Courtesy, Palisades Interstate Park Commission

STORM KING HIGHWAY

This highway is virtually a parkway, particularly the parts of it in the Palisades Interstate Park. Because of its use as a general highway (part of radial Route 9) it is shown as a general traffic route.

The advantages of constructing a parkway along a new line, instead of widening an existing highway include the greater ease and smaller cost with which grade separation can be accomplished, as on parkway routes there would ordinarily be fewer intersections with existing streets; the avoidance of costly acquisition of frontage land, often occupied by buildings; and the facility with which arrangement can be made for the safety of the pedestrian as well as the occupant of vehicles. For these and other reasons it is desirable that a large proportion of the new traffic ways to be provided in the future should consist of parkways. Existing highways should

also be converted into boulevards wherever it is desired to promote or conserve good residential growth on adjacent land. This conversion would take the form of utilizing the highway reservation for the planting of trees and grass and increasing the width for this purpose when necessary. It is of great importance that the land abutting on such boulevards should be zoned and the buildings set back so as to give to the boulevard something of the character of a parkway.

Reference is made later to the value of parkways and boulevards as approaches to parks. Ordinary highways may be regarded as performing a valuable and necessary service in this connection. They are usually the only ways available for the inhabitants of crowded sections of the city to drive into the country or to obtain access to country parks. At week-ends and holidays many highways are crowded with the vehicles of those who are seeking recreation, with consequent interference to normal everyday uses. It follows that when new parkways are provided as approaches to parks, two ends are gained, namely, congestion of traffic is lessened on existing highways, permitting commercial vehicles to have greater facility of movement, and pleasure cars enjoy the pleasant environment of the more attractive road. It is therefore highly desirable, in the interests of the efficiency of the highway system, that it should be supplemented by a comprehensive parkway and boulevard system co-ordinated with the highways on the one hand, and with the recreation areas on the other hand.

What has been done in Westchester County in developing a park and parkway system proves in the most convincing way the advantage of supplementing an improved highway system with a system of parkways and parks. This county started this development with some hesitancy only a few years ago. What, for a time, was considered to be more or less a luxury for a rich county has become one of the most significant undertakings, from an economic point of view, that has been carried out in New York and its environs. Because of what has been accomplished in Westchester in the development of parkways, as well as of parks, it has been unnecessary to incorporate in any part of the Regional Plan a more ambitious parkway and park system for any county than has already been initiated and partly carried out in one county. The work of the Commission is referred to in the statement of financial considerations[1] and also in the description of park proposals.[2]

Figure 21 (page 295) shows the principal proposals for major parkways and boulevards in addition to the regional system of major general highways.

Description of Proposed System.—In presenting the following description of parkways and boulevards as part of the system of ways of communication by road, it has been necessary to indicate also their relation to the park proposals which are described under Land Uses. Parkways and boulevards are so related to parks that it would have been appropriate to have described them together. But, owing to their

[1] See pages 301–305.

[2] See page 342.

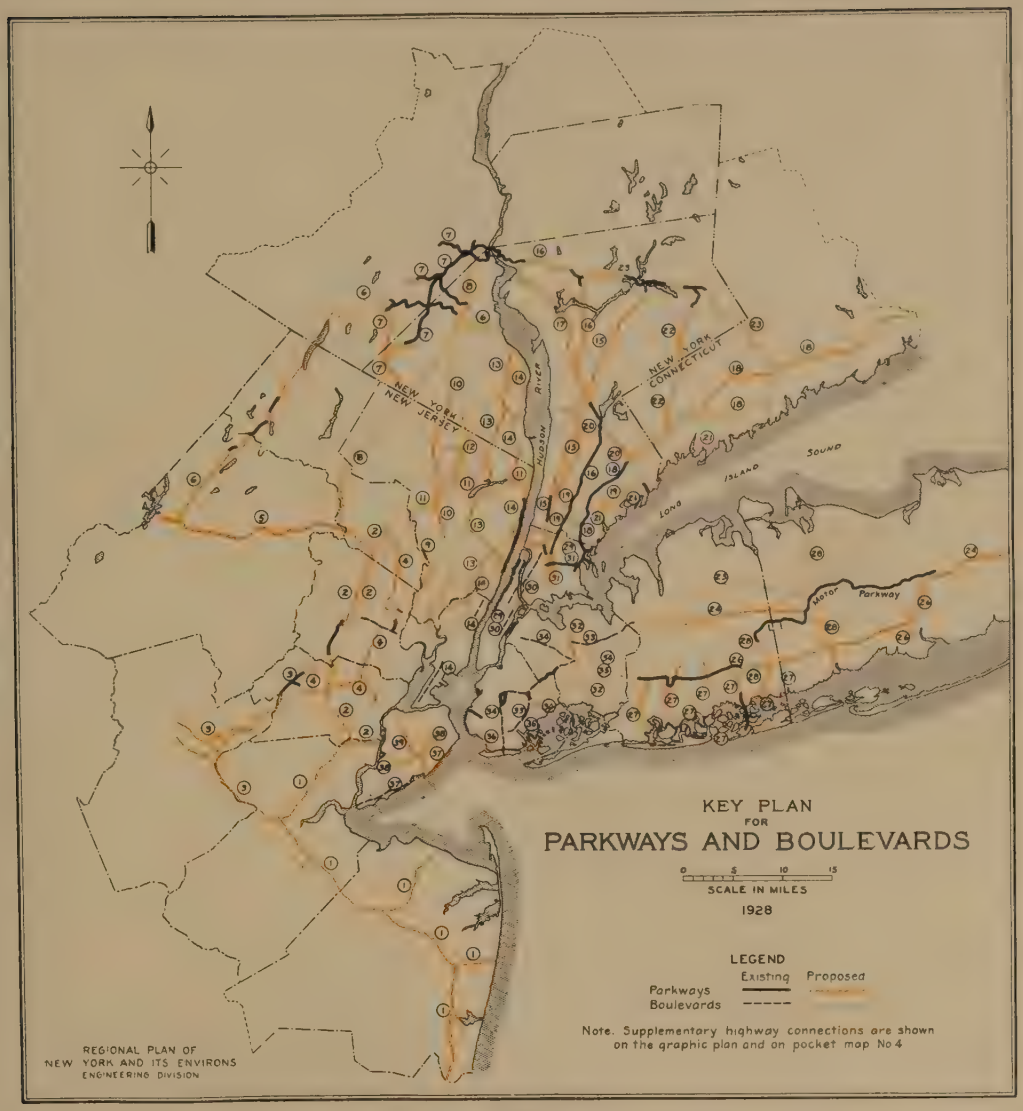


FIG. 20

dual relation, it is desirable to describe them here, and leave it to be understood that they should be reconsidered in connection with the park proposals that are described later.[1] The latter include several long and narrow proposed parks, in general follow-

[1] See pages 336–355.

ing attractive waterways, which might possibly be converted into parkways by constructing roadways through them. But in these cases the preservation of natural features and the provision of opportunity for recreation are considered of paramount importance and no roadways are indicated on the Graphic Plan. Such proposed parks are therefore not referred to in the following description of parkway and boulevard routes.

Parkway and Boulevard Routes in the Environs

(1) A parkway route is proposed from Rahway, in Union County, through Middlesex and Monmouth Counties to the Atlantic Coast, with several branches in Monmouth County. The main route is essentially a radial parkway, although its actual alignment partly coincides in direction with a circumferential route in the general pattern of ways of communications. It would provide a convenient mainland approach from New York City and northern New Jersey to Long Branch and points south along the Jersey shore.

The portion from Rahway to New Brunswick is unmistakably radial in direction and roughly parallel to the Lincoln Highway. Much of the passenger traffic now using the latter highway would be diverted to the parkway route between these points, particularly motorists with objectives along the Jersey shore. At Rahway a connection is provided with proposed boulevard and parkway route No. 2 along the Rahway River. At Metuchen access would be afforded to a proposed recreational area[1] of regional importance. At New Brunswick this parkway connects with a proposed Raritan River parkway (No. 3) affording at this point access to a proposed park on the Raritan River bluffs.

Continuing southeasterly[2] along the South River the route extends through the interior of Monmouth County to a point about two miles west of Long Branch, where it turns southward toward Atlantic City. From a proposed park in the Mount Pleasant Hills[3] through which the parkway passes, a branch parkway is proposed northerly to Port Monmouth, connecting with the highway which runs along the shore to Sandy Hook. Connections from the main parkway are also proposed to the southern part of Long Branch and to the vicinity of Belmar. Along the shore from Sandy Hook to Avon-by-the-Sea the ocean drive, for the most part an existing roadway, is suggested as a boulevard and would form an important adjunct to the parkway system in Monmouth County.

(2) A parkway is proposed roughly parallel to the Metropolitan Loop from Paterson to the Arthur Kill. Its major function would be to afford a pleasant and convenient way for the people of northern New Jersey to reach highway routes leading to the south. It is located outside of present and expected populous areas and is distinctly circumferential in character.

Beginning at Paterson it follows the Passaic River to Little Falls; thence it leaves the river and extends southerly along the relatively high valley between the First and Second Watchung Mountains. It passes within a half mile of Eagle Rock Park Reservation, to which a local connection is proposed, and goes directly through the South Mountain Reservation; thence a connection is proposed with the existing Rahway Parkway lands of the Union County park system. It follows these lands, with the exception of one proposed boulevard connection, to Rahway; thence it extends along a proposed extension of park lands to the Arthur Kill, where connection would be afforded via the Carteret Ferry to boulevard and parkway routes on Staten Island.

The northerly part of this route is supplemented by a secondary boulevard which runs along the crest of First Watchung Mountain between the South Mountain Reservation and Garret Rock in Paterson. This borders some existing and proposed park lands.

[1] See park proposal No. 4, page 344.

[2] See outer circumferential Route B–1, page 257, for a more detailed description.

[3] See park proposal No. 2, page 344.

(3) Starting at Summit (whence connection is furnished to parkway route No. 2 over a general highway) a parkway route is proposed along the southerly part of the Watchung Mountain range to Bound Brook and thence southeasterly along the Raritan River to parkway route No. 1 near New Brunswick. North of Bound Brook this route is largely on the crest of First Watchung Mountain, passing through the Watchung Reservation of the Union County park system. It descends the ridge to meet the Raritan River at Bound Brook. The section of the route along the Raritan River follows the north bank of that river. From Washington Rock a branch of this route extends around the site of the Chimney Rock Reservoir, which is proposed as part of the water supply system for northern New Jersey.

(4) This is a proposed parkway and boulevard route through the densely populated section of New Jersey to the east of the Watchung Mountains. From an intersection with parkway route No. 3 in the Watchung Reservation it passes easterly through Union County park lands in the central part of Union County; thence swinging northerly along the Elizabeth River through lands proposed by the Union County Park Commission as a future park and a proposed extension thereof to Vailsburg Park in Newark; thence along Oraton Parkway North (a boulevard in character) to Park Avenue which is an east and west boulevard passing through parts of Newark and the Oranges. North of Park Avenue, this route extends through Branch Brook Park; thence as a proposed parkway along the abandoned Morris Canal to Paterson.

Branches of this route include a boulevard from Vailsburg Park south to Springfield Avenue along Oraton Parkway South and southerly along the Elizabeth River to the vicinity of the city of Elizabeth.

(5) Beginning at parkway proposal No. 2 at Little Falls a radial parkway is shown to Lake Hopatcong.[1] It follows the abandoned Morris Canal as far as Rockaway, where it strikes across the country in a fairly direct line to the lake. It affords access to a proposed park northeast of Lake Hopatcong.

(6) A parkway and boulevard route is proposed in the vicinity of Lake Hopatcong through the mountainous areas in the northwesterly part of the Region to the Hudson River at Haverstraw. From its beginning on proposed parkway route No. 5 to Greenwood Lake Village, it is shown as a parkway largely within existing water supply property owned by the city of Newark and proposed park or reservation lands. It passes through Longwood Valley and skirts the westerly shore of Greenwood Lake. It continues as a secondary boulevard over an existing highly scenic road that climbs easterly over the Ramapo Mountains and passes down the valley of Indian Hill Brook to meet the Seven Lakes Drive in the Palisades Interstate Park. It passes easterly through this park and continues as a proposed parkway and boulevard to join other similar routes proposed along the west shore of the Hudson River. (See No. 14.)

(7) Radial parkway routes are shown through Rockland and Orange Counties from Suffern to and through the Bear Mountain Reservation of the Palisades Interstate Park system. From Suffern a route extends along the Ramapo River through proposed park lands to Southfields. There is now an existing state highway between these points. This parkway route will provide additional lanes, freedom of movement, segregation of traffic and a by-pass route around Suffern, all of which will relieve the traffic congestion on the present highway.

From Sloatsburg a portion of this route would swing northeasterly to enter the Bear Mountain Park and thence through that park via a portion of the Seven Lakes Drive to the Bear Mountain Bridge over the Hudson River. It would intersect two east and west parkway routes through the existing park lands.

(8) A parkway is suggested along the Pompton River from parkway proposal No. 5 at Mountain View northerly to Pompton Lakes; thence it continues as a boulevard along the foot of the Ramapo

[1] See radial route 13–B, page 252, for a more detailed description.

Mountains, skirting proposed park lands throughout most of its length. It passes through Oakland, Darlington, Suffern and Letchworth Village. Beyond Rider Hill it follows Cedar Palm Brook as a parkway through the Bear Mountain Park, affording a direct approach to the Bear Mountain Bridge. From Pompton Lakes to Suffern this route follows the Ramapo River; between Suffern and Letchworth Village it is along the Mahwah River.

(9) The Passaic River between Newark and Paterson needs the protection that can be obtained only with public ownership of its banks.[1] Though it is partly built up with industry and other types of use—particularly in Newark, Passaic, Garfield and Paterson—it is still considered feasible to acquire considerable land on both banks for park and parkway purposes. With the sewage eliminated from its waters the river could be used for boating and bathing; the shores could be made available for strolling, riding and other recreation. The roadways on each side along or through the park lands would furnish delightful ways for motorists to travel between Newark and Paterson.

A boulevard route is shown from parkway and boulevard proposal No. 4 at Soho, down Second River to the Passaic River; thence the route extends along the westerly shore of the Passaic River to a point just south of the City of Passaic; thence, on account of the existing development along the river at Wallington and Passaic, it crosses the river and passes Wallington on the east, returning to the east shore of the river at Garfield. Incidentally this detour from the line of the river furnishes a more direct highway route. In the northerly part of Garfield it crosses again to the west bank of the Passaic River, which is followed to the northerly part of Paterson.

(10) Bergen and Rockland Counties between the Ramapo Mountains and the Hudson River present topographic configurations strongly suggestive of lower Westchester County. A succession of hill ranges and streams run north and south and offer opportunities for the organization of a parkway system comparable to that of Westchester. The hills are lower than in Westchester County and the streams are farther apart. One of the most attractive of these parkway possibilities is along the beautiful valley of the Saddle River.

Beginning at Garfield and connecting with the proposed Passaic River Parkway (No. 9) is an existing roadway along the Saddle River to Rochelle Park. It is proposed to retain this as a highway for general traffic and to acquire the banks of the river for park purposes. At Rochelle Park the parkway proper begins and extends to Monsey in Rockland County, a distance of about 15 miles. North of Monsey to parkway route No. 8 at Ladentown, this route continues as a proposed boulevard over an existing highway. A combination of the Saddle River Parkway, parts of the Passaic River Parkway and the Ramapo Parkway (No. 8) provides a new and direct route for pleasure traffic between Newark and the Bear Mountain Bridge.

(11) A cross-country route is shown from Paterson to the Hudson River in the northerly part of Alpine Borough. Beginning at the northerly end of the Passaic River Parkway (No. 9) at Paterson, it crosses north of Fairlawn to the Saddle River Parkway, which it follows north for about a mile; thence it strikes northeasterly along the line of the upper branch of the proposed railroad belt line into the valley of Musquapsink Creek and connects with outer circumferential Route B north of Oradell Reservoir. Crossing the reservoir by this general traffic route it continues easterly, ascending the westerly slope of the Palisades through a proposed park to terminate upon the boulevard proposed along the top of the Palisades.

(12) An arterial parkway is shown beginning at a point midway between Ridgewood and Oradell on the proposed cross-country parkway (No. 11). Extending northward along the Musquapsink Creek to a point opposite Westwood, it then continues north along Woodcliff Lake and the Pascack Creek to Spring Valley. At this point traffic can continue north on radial Route 10 or cut

[1] See Regional Survey, Volume V, page 60.

across below Spring Valley on outer circumferential Route C–1 to Monsey, where it can continue north on the Saddle River Parkway (No. 10).

(13) The Hackensack River, like the Passaic River, has been partly claimed for industrial use.[1] On the Graphic Plan it is proposed to extend this use as far north as Secaucus but to discourage industrial occupancy in the northern part of the Hackensack meadows. Two boulevard loops are shown in the Hackensack meadows following the various creeks, canals and river banks, and connecting with the Passaic River Parkway (No. 9) in Lyndhurst. This proposal is made as part of the plan to develop the meadows as a self-contained unit.[2]

Photo by Fairchild Aerial Surveys, Inc.

HIGHWAYS ALONG THE HUDSON RIVER IN BERGEN COUNTY

Route 9-B and the Hendrick Hudson Drive are for passenger traffic only; route 9 is for general traffic and a part of the proposed express highway system.

A large portion of the banks of the Hackensack above Secaucus should be developed as a parkway. The line chosen avoids the existing industrial developments along the Hackensack River between Little Ferry and Ridgefield by following the Overpeck Creek valley from Little Ferry north to the proposed express highway from the Hudson River Bridge to Suffern; thence it turns west alongside the express highway and reaches the Hackensack River again in the northerly part of Hackensack. It continues north along the river into Rockland County, crossing the Oradell Reservoir via a short section of outer circumferential Route B. Through Rockland County it passes through Orangeville and West Nyack; thence it follows the west branch of the Hackensack River and Toms Brook and traverses a pass in the mountains called Short Clove to join radial Route 9 below Haverstraw.

[1] See Regional Survey, Volume IV, page 152, and Plan Volume II.

[2] See Land Uses, page 323.

Except for a short strip of existing roadway at Oradell Reservoir this route is entirely along a new right-of-way.

(14) Along the west shore of the Hudson River, between Weehawken and Haverstraw, a route is proposed, partly parkway and partly boulevard, which might be called the Palisades Parkway. It is proposed to purchase for park use the cliffs of the Palisades along the easterly branch of Hudson Boulevard in Hudson County, thus assuring a permanent view of the river along this section of the route. Continuing north in Bergen County along the top of the cliff a parkway and boulevard route is proposed close to the shore of the Hudson River to the New York-New Jersey state line. Between Edgewater and Fort Lee it is suggested that only a boulevard is feasible.

Between Fort Lee and Alpine this route has two parts—a parkway route along the foot of the cliffs and a boulevard route above and near the edge of the cliffs. Both sections follow existing routes, although the lower road between Fort Lee and the Dyckman Street Ferry had not yet been paved in 1928.

From Alpine to the cross-country parkway (No. 11) this route is shown as a proposed boulevard; thence it extends as a parkway through proposed park lands to the community of Palisades in Rockland County; thence as a boulevard again to Sparkill. From this point the route swings into the interior as a secondary boulevard and passes through the westerly part of the Blauvelt Reservation of the Palisades Interstate Park system; thence it continues northwesterly to unite with the Hackensack River Parkway (No. 13) at West Nyack. After continuing for about two miles along the latter route it swings easterly along the east branch of the Hackensack River and comes out along the shore of the Hudson River at Hook Mountain; thence it continues along the shore of the Hudson River through the Palisades Interstate Park; thence as a boulevard to Haverstraw, where it connects with parkway and boulevard route No. 6 which would provide access to Bear Mountain Park.

The Palisades Parkway can be designed so that it would be one of the most striking and attractive parkways in the Region. It would also be of considerable importance in providing needed lanes for traffic, thus relieving the general traffic highways along the west shore of the Hudson River. Of about 40 miles of roadway, over half is along existing rights-of-way; about 12 miles lie within existing parks.

A short parkway connection is proposed between this route and the Hackensack River Parkway (No. 13) in Englewood and Leonia. A branch parkway is also suggested from the cross country parkway (No. 11) at the easterly end of the Oradell Reservoir northeasterly along Sparkill Creek to connect with the Palisades Parkway at Sparkill.

South of the Hudson River Bridge at Fort Lee there would be a branch of this route on the westerly side of the ridge formed by the Palisades and Bergen Hill. This is shown as a proposed secondary boulevard connecting near the Hudson-Bergen County line with the main Hudson Boulevard, which extends to the southerly part of Bayonne. As the central part of this boulevard (through Jersey City and some of the communities to the north) has no boulevard features as defined in this report,[1] and it does not seem feasible to provide such features, this part has been shown as a general highway.

(15) The Saw Mill River Parkway and the following five parkway routes are based on projects being carried out by the Westchester County Park Commission.[2] Some extensions to these routes are proposed.

Connecting with proposed routes through Van Cortlandt Park in New York City, the Saw Mill River Parkway extends in a radial direction to the New York City reservoir system in the Croton valley near Katonah. A section of this route through Yonkers was opened to traffic in 1927. As far as

[1] See page 269.

[2] The Westchester County Park Commission has also planned a Pelham-Port Chester Parkway parallel to the Boston Post Road. As this is intended for all types of vehicular traffic, it has been shown on the Regional Plan as an express highway and is not included in the parkway and boulevard routes. It is described as part of radial Route 5 on page 244.

Hawthorne it is a part of radial Route 8–B;[1] thence it swings inland toward the center of Westchester County, passing through Pleasantville, Chappaqua, Mount Kisco and Bedford Hills.

Through the northerly part of Yonkers and the town of Greenburg this route is supplemented by the Sprain Brook Parkway which parallels it in this section. A short branch of the main parkway connects with the Albany Post Road at Hastings.

(16) The Bronx River Parkway was jointly constructed by New York City and Westchester County and has furnished a pattern for most of the later parkway routes in the New York region. As originally constructed it connected Bronx Park in New York City with the water supply properties around the Kensico Reservoir in Westchester County. The Westchester County Park Commission is extending this route, under the name of the Bronx Parkway Extension, to and across Peekskill Creek and a connection with the Bear Mountain Bridge across the Hudson River. That part of this extension west of the Albany Post Road in Peekskill and the first two miles north of Kensico Dam were opened to traffic in 1928. The southerly half of this route has been described as radial Route 7–B[2] and the section between Mohansic Park and Bear Mountain Bridge is a part of outer circumferential Route C.[3]

(17) A Briarcliff-Peekskill Parkway is projected by the Westchester County Park Commission. Starting on the Bronx Parkway Extension at Briarcliff Manor it would rejoin it in Peekskill and would furnish a more direct route between these two points. For that reason it has been shown on the Graphic Regional Plan as a portion of radial Route 8–B, which parallels the Albany Post Road south of Peekskill.[4] This route passes over the new Croton Dam and through the Blue Mountain Park Reservation south of Peekskill.

(18) The Hutchinson River Parkway has been laid out by the Westchester County Park Commission from Pelham Bay Park in New York City to the Connecticut state line north of Port Chester. This route was completed and opened to traffic in 1928 as far north as Westchester Avenue in White Plains. The Graphic Plan shows a proposed extension of this parkway through Fairfield County, Connecticut, as far as the City of Bridgeport. Located between three and five miles inland, this extension would afford a by-pass around the Connecticut shore communities for traffic between the New York region and points beyond Bridgeport. It would intercept traffic from the interior of Connecticut bound for New York City and thus relieve to a very great extent the congestion upon the Boston Post Road. It forms an ideal approach to New York City from the estate development through which it passes, and although the topography along its route is more rolling than that through which the Post Road passes, its grades are easy and its line practically as direct as that of the Post Road.

Between Stamford and Norwalk a branch boulevard is proposed. This passes much closer to the built-up communities between those points and would afford them readier access to the main route.

(19) The Cross-county Parkway runs in an east and west direction across the southerly part of Westchester County, intersecting all the radial parkways described above. Its westerly terminus is at Tibbetts Brook Park in the City of Yonkers and its easterly terminus is at Rye Beach, where the Westchester County Park Commission has opened a public amusement park. Between Tibbetts Brook Park and the Hutchinson River Parkway it is proposed that this route be parallelled by a general traffic route to form part of outer circumferential Route B.[5] A section through Mamaroneck and Rye coincides with a part of radial Route 5, an express highway in Westchester County.

The Odell Parkway might be considered as supplementary to the Cross-county Parkway, as it also furnishes an east and west route through the southerly part of the county. It runs between the Bronx River Parkway, at a point 3,000 feet north of its intersection with the Cross-county Parkway, and the Saw Mill River Parkway in the northerly part of Yonkers.

[1] See page 248 for a detailed description.
[2] See page 247.
[3] See page 258.
[4] See page 248.
[5] See page 256.

(20) The Mamaroneck River Parkway has been laid out by Westchester County from the Hutchinson River Parkway at the easterly edge of White Plains to a connection at the northerly boundary of White Plains with the main highway which passes to the east of Kensico Reservoir. It is proposed on the Graphic Plan to extend this route westerly from the northern part of White Plains to the Albany Post Road in Tarrytown. It would have been desirable to make this extension a parkway throughout its length, but as the necessary land could probably not be obtained at reasonable cost it has been shown throughout most of its length as a secondary boulevard parallel to the Tarrytown-White Plains Road. At its westerly end it passes through a proposed park area on the east edge of Tarrytown.

(21) In addition to the new radial routes being developed by the Westchester County Park Commission, a secondary boulevard is proposed along the shore of Long Island Sound east of the Boston Post Road. Beginning at Pelham Bay Park in New York City this extends as far as Rowayton on the outskirts of Norwalk in Fairfield County. Although classified as a boulevard it would be as attractive as most parkways because of the numerous views of Long Island Sound and of harbors and inlets along its path. The value of the right-of-way and the numerous approaches necessary would make its construction and maintenance an expensive undertaking, but it would be in harmony with the type of development that may reasonably be expected along the shore if such an approach from New York City were provided.

Courtesy, Westchester County Park Commission

CROSS-COUNTY PARKWAY, WESTCHESTER COUNTY
The easterly terminal section between the Boston Post Road and Rye Beach; opened in 1928.

At Rowayton a connection is proposed to Norwalk via a secondary general highway and a parkway connection is proposed northerly along Five Mile River to the southerly branch of the proposed extension of the Hutchinson River Parkway (No. 18). From Goat Island in New Rochelle a suggested branch boulevard is shown northerly to the Cross-county Parkway (No. 19); thence continuing along the Sheldrake River to the Hutchinson River Parkway (No. 18).

(22) Branching off the proposed extension of the Hutchinson River Parkway (No. 18) at Horseneck Brook in the town of Greenwich, a parkway route is suggested northerly to a connection with radial Route 6;[1] branching off this general highway about two miles to the north it continues through the westerly edge of the proposed park of the Mianus Gorge.[2] At Indian Hill east of Bedford it leaves the Mianus River and continues northerly into Poundridge Park Reservation, connecting with the Mohansic-Norwalk Parkway (No. 23) within this reservation.

This parkway would furnish a valuable radial pleasure route in the Region and afford access from the central areas to Putnam Lake, Rockwood Lake, Poundridge Reservation and the beautiful gorge of the Mianus.

(23) The Mohansic-Norwalk Parkway is proposed as a circumferential route passing through the northerly part of Westchester County and connecting the outer edge of the most important radial parkways in the sector between the Hudson River and Long Island Sound. Through a section of parkway proposal No. 16 it connects the Connecticut shore resorts with the Bear Mountain Bridge. West of

[1] This forms a part of radial Route 6-B. (See page 246.)
[2] See park proposal No. 21, page 350.

Katonah it forms part of outer circumferential Route C[1] and west of the Poundridge Reservation it forms part of the proposed Metropolitan By-pass.

Starting at Mohansic Park, where it connects with the Bronx Parkway Extension (No. 16), it passes north of Yorktown Heights between Amawalk and the Muscoot Reservoir to Katonah; thence it follows the north shore of Cross River Reservoir to Poundridge Reservation. Throughout this part of its route it passes through New York City water supply property and proposed extensions thereto and is almost entirely over existing roads. It continues southeasterly between Cross Pond and Trinity Lake and then crosses into the valley of the Silvermine River -passing through a large proposed park area[2] which it follows into Norwalk and a connection with parkway proposal No. 18.

(24) One of the most striking proposals for Long Island is the location of a parkway, averaging several hundred feet in width, in the center of the Island extending from the New York City boundary to Hither Hills Park, which is within ten miles of the easterly end of the Island. It absorbs the function, as well as parts of the right-of-way, of the Motor Parkway. It continues, from the boundary line of Queens borough and Nassau County, the projected Grand Central Parkway in New York City and also is provided with a connection to the extension of the Nassau Boulevard. It affords direct access to park proposals in the Manetto Hills and in the Half Hollow Hills; it also provides direct access to Camp Upton State Forest and Hither Hills Park, as well as to numerous small park proposals along its alignment.

It is believed that the line adopted for this parkway is superior for traffic and recreation purposes to others that have been suggested. Its directness, the fact that it uses portions of the existing Long Island Motor Parkway, and that, like the Bronx River Parkway, it will improve the amenities and land values of the areas through which it passes, are all favorable to its adoption. It is of course not a definite line—but one which should be followed, with such deviation as may be made necessary, after negotiation with the owners of property and the consideration of costs. This project has a bearing on the one which follows relating to the making of a secondary boulevard or pleasure road through Wheatley Hills, because in a sense these two projects together form an alternative to the proposed Northern State Parkway which was first suggested to follow a more northerly route than that designated on the Graphic Plan.

(25) There is a proposal in the Graphic Plan for a secondary boulevard through the Wheatley Hills. It follows for most of its length the lines of the existing roads and is little more than a suggestion that the character of the existing roads should be changed as little as possible—except for necessary and appropriate widenings and removal of dangerous curves.

It is not proposed, in this case, that the ordinary type of boulevard with straight planted strips or avenues of trees be adopted, but that the highways now existing should be somewhat improved in width and alignment with the preservation of their rural character. This would involve planning the boulevard as a sort of pleasure drive with trees and grass margins forming a natural furnishing with varied treatment of different sections. In some places only rough grass verges and overhanging trees from the private lands would distinguish the road—in others the verges might spread out to have the spaciousness and natural charm of a New England village green. It should never be a speedway, or have separated grades to invite fast traffic. The straightening of the roads should be carried out in harmony with the above conception of what the road should be.

In the description of open development areas reasons are given for the absence on the Plan of any large parks in the northern part of Long Island.[3] These reasons apply with greater force to explain the omission of parkways and speedways through what is known as the Wheatley Hills section. They are not desirable so long as there is no occasion, and no tendency, that will cause subdivisions to replace the

[1] See page 258. [2] See park proposal No. 22, page 350. [3] See pages 377–379.

present open development. It is clearly in the interest of the public that the existing open uses should be continued so long as they are economically sound, since their continuance is not only most profitable to the communities but also most advantageous to them from the point of view of preserving open space and beautiful landscape for the public to enjoy without any cost to themselves.

The proposed boulevard which is here suggested to have the special features of a rural highway over a considerable part of its length begins at the Nassau Boulevard at the New York City boundary and extends north of Lake Surprise, by Old Westbury and Wheatley, south of Syosset and Woodbury, through the Manetto Hills to Melville and joins the Motor Parkway beyond the Dix Hills south of Commack.

Its improvement should not be hurried and may possibly be deferred until the time comes when there is a further subdivision of the large properties to smaller estates of an acre or more in extent. This seems to be the natural line of transition to expect in this area with its distance from means of

Photos by W. E. Strong

VIEWS ALONG THE LONG ISLAND MOTOR PARKWAY

It is proposed that the major parkway serving the central part of the Island absorb and adapt certain portions of this right-of-way. The left-hand view is at the intersection with Jericho Turnpike east of Mineola; the right-hand view is north of Mineola and shows the adaptability of this part of the route for parkway purposes.

communication by rail and its high value for open residence. To enable the area to be preserved in its present character, it is important that the private owners should co-operate with the public authorities in carrying out a zoning scheme which will prevent building near to the boundary lines of the roads. Such buildings should be set back at least 50 feet and should be in conformity with good architectural design.

It will be impossible to prevent the destruction of the amenities of the district or to justify any proposal to defer the building of parkways devoted to fast traffic, unless owners are prepared to mutually agree on proper methods of controlling the development of their estates where they abut on existing roads.

(26) An extension of the Southern State Parkway, which is now under construction, is proposed to a point north of Deer Range Park with connections to the Central Parkway at Lake Ronkonkoma, and to Deer Range Park.

(27) In keeping with the proposal to reserve considerable space for public recreation on the islands of the South Shore bays[1] a number of parkway and boulevard loops are suggested to provide proper access from the mainland. Connecting with a proposed boulevard in New York City at the

[1] See park proposal No. 26, page 351.

head of Jamaica Bay a proposed Shore Boulevard passes by Hewlett to the islands between Brosewere Bay and Hewlett Bay. Crossing the channel at Hicks Beach it uses Park Street of Long Beach and continues near the shore of the ocean to the Nassau-Suffolk County line. Here it turns northward across South Oyster Bay and thence westerly along the shore of the mainland, finally completing the loop at a point on an island between Brosewere Bay and Hewlett Bay. A cross connection in the loop is now being constructed at Jones Beach. Another is suggested across Big Sand Creek north of Jones Inlet.

Several connections are proposed to make the loop accessible from inland circulation units. One of these extends to the State Park at Valley Stream Pond and connects with the Southern State Parkway. Another passes between Lynbrook and Rockville Center along Mill River to connect with the Southern State Parkway at Hempstead Reservoir. Still another passes east of Freeport along a State Park.

Courtesy, Long Island State Park Commission

SOUTHERN STATE PARKWAY, LONG ISLAND

This picture was taken near Valley Stream. The roadway was opened to traffic in 1927.

Jones Beach Causeway is extended as far north as the Southern State Parkway. At the easterly end of the loop an extension northerly passes along Carman Creek to connect with outer circumferential Route C beyond Amityville.

(28) A cross-island boulevard and parkway route is proposed across the western end of Suffolk County with a southern branch entering into Nassau County.

Starting on the north at Centerport this route is shown as a proposed secondary boulevard, mostly along an existing highway to the Central Park· ay at a proposed park area in the Half Hollow Hills.[1] Within this proposed park it splits into two branches. The easterly one is shown as a proposed parkway passing through the Belmont State Park and along Carlls River to radial Route 1 at Babylon. The westerly branch follows the Long Island Motor Parkway—which while not actually a parkway as defined in this volume is so nearly equivalent to one that it has been shown as an existing parkway on Fig. 20—as far as Bethage Junction; thence it continues southerly along Massatayun Creek and through the State Park at Massapequa to terminate on the parkway and boulevard loop around the South Shore bays (No. 27).

[1] See park proposal No. 24, page 350.

PARKWAY AND BOULEVARD ROUTES IN NEW YORK CITY

(29) It is proposed to extend Riverside Drive northerly through Inwood Hill Park across the Harlem River on a high level bridge and through the westerly edge of the borough of The Bronx to a point near the New York City-Westchester County line. At this point a boulevard is proposed to swing easterly approximately parallel to the city line to a connection with the boulevard proposed along the shore of Long Island Sound (No. 21). This would form a crosstown boulevard with connections to the Saw Mill River, Bronx River and Hutchinson River Parkways in Westchester County.

A branch of this route swings into the Tibbetts Brook Valley near Spuyten Duyvil and follows that brook to join with a parkway loop around the borders of Van Cortlandt Park.

(30) A boulevard route is shown on the east side of Manhattan as an extension, north of 96th Street, of the southerly part of Park Avenue, which has been classified as an existing boulevard. (The proposed boulevard treatment of the northerly part of Park Avenue is based on placing the New York Central Railroad tracks in tunnel south of the Harlem River.) Continuing across the Harlem River a boulevard connection is proposed to the southerly terminus of the Grand Boulevard and Concourse which is followed to Mosholu Parkway. At the Harlem River this boulevard route connects with a parkway proposed along the Manhattan shore of the Harlem River as a southerly extension of the present Harlem River Driveway.

At 110th Street this route would connect with a crosstown secondary boulevard, which it is proposed to develop along this street between Riverside Drive and a connection with the projected Tri-borough Bridge on Wards Island. The existing boulevard along Seventh Avenue from Central Park to the Harlem River would form a connection between this crosstown boulevard and the main route.

(31) This utilizes the north and south routes already in existence in The Bronx, such as the Bronx River Parkway and Mosholu Parkway which now have their southern termini in Bronx Park. It is proposed to extend these routes southerly along the east side of Bronx Park, swinging back to the river below the park and continuing along the stream to a connection with the Metropolitan Loop and the arterial express highway which is proposed through the easterly part of the borough of The Bronx.

The Bronx and Pelham Parkway has been considered as a branch of this route and connects it with the Hutchinson River Parkway and the proposed shore boulevard in Westchester County.

(32) A cross-island boulevard is proposed through the borough of Queens connecting at the north with a proposed bridge over the East River between Whitestone and Old Ferry Point. It follows a mapped street (Willets Point Boulevard) to Flushing River and along the westerly shore of that stream. It continues along and through a proposed park in the upper Flushing meadows and connects, via a short section of Queens Boulevard and a proposed new connection, with Van Wyck Boulevard (which is a boulevard in name only). It is proposed that the latter street be developed as a boulevard to Jamaica Bay, whence the route swings easterly along the shore of the Bay to connect with parkway and boulevard route No. 27 in Nassau County.

(33) This would form a circumferential boulevard in the borough of Brooklyn and an arterial boulevard in the borough of Queens. It follows Avenue P and Kings Highway from Ocean Parkway to Eastern Parkway; thence a boulevard connection is proposed along existing streets with some short new connections to Eliot Avenue.[1] This section of the route would be very costly and would probably require the acquisition of a half block of property all the way from Eastern Parkway to Eliot Avenue. Much of this property is now occupied with inexpensive frame houses and it is believed that the incidental benefits which would accrue from a boulevard route through this part of the city would justify the necessary expenditure. The route continues along Eliot Avenue and Nassau Boulevard to the city line, where connection is afforded with parkway and boulevard routes Nos. 24 and 25 in Nassau County.

[1] See description of inner Route "f," page 237.

(34) This would be the main central parkway and boulevard route through Brooklyn and Queens and is entirely over existing and mapped streets, more than half of which already have boulevard treatment. Starting at Coney Island it follows Ocean Parkway, Eastern Boulevard, Highland Boulevard, Interborough Parkway (in course of construction in 1929), Union Turnpike and Grand Central Parkway to a connection with the Central Parkway proposed in Nassau County (No. 24).

Queens Boulevard connects this route with the northwestern part of Queens and, via the Queensboro Bridge, with the borough of Manhattan. Rockaway Parkway is shown as a proposed secondary boulevard connecting the Eastern Parkway section of this route with Carnarsie Beach Park.

(35) This would provide a southern radial parkway in Brooklyn and Queens. The westerly part of it is in the course of construction and the easterly part was officially proposed in 1928 by the borough of Queens. Starting from boulevard route No. 33 at Remsen Avenue it follows the projected Linden Boulevard to Conduit Boulevard; thence a connection is proposed to 114th Avenue. The route follows this avenue, Westchester Avenue and Foch Boulevard to connect with the Southern State Parkway in Nassau County.

(36) This is a proposed shore route in the southern part of Brooklyn. Starting at boulevard route No. 33 it follows Ralph Avenue to Marine Park; thence along Sheepshead Bay, Coney Island Creek and Gravesend Bay to a connection with the existing Shore Road at Fort Hamilton.

Courtesy, Topographical Bureau, Borough of Queens

PRELIMINARY DEVELOPMENT OF NASSAU BOULEVARD

The view was taken looking west from Bell Boulevard, borough of Queens; this section was opened to traffic in 1928.

(37) This would provide an ocean-front boulevard along the south shore of the borough of Richmond. Starting at the westerly terminus of a Narrows Crossing, it is shown southerly to the shore; thence southwesterly along proposed park lands to a connection with Hylan Boulevard at Great Kills. This existing street is followed to its terminus at the mouth of the Arthur Kill. Near Pleasant Plains a connection is proposed to the main highway leading to the Perth Amboy-Tottenville Bridge (Outerbridge Crossing).

(38) A parkway is proposed through the rugged hills in the central part of the borough of Richmond, forming a connection between the proposed Narrows Crossing and the Outerbridge Crossing to Perth Amboy. A considerable part of this route passes through park lands acquired in 1928 as well as through additional proposed parks. A connection is suggested between this parkway and Victory Boulevard at Clove Lake Park. Another branch is suggested along Fresh Kills to Linoleumville, where highway and ferry connection would be afforded to the Rahway River Parkway in New Jersey (No. 2).

Although there will be some difficulties of a topographic nature encountered on the main route, they are not insurmountable and a parkway thus located would constitute one of the largest assets possible in the development of Staten Island.

(39) A cross-island parkway on Staten Island is proposed between the Goethals Bridge to Elizabethport and the proposed Marine Park at Great Kills. This route also traverses the large new park area acquired by the city in 1928.

Supplementary Major Regional Routes

The major regional highways described on the preceding pages include all those which are shown in the general diagram and key plan, as illustrated in Figures 11 and 12, respectively (pages 218 and 219), and also all boulevard and parkway routes. In order to round these out into a complete scheme of major routes several additional general highway connections are necessary and have been added in Pocket Map No. 2 at the back of this volume. Most of these are within the area circumscribed by the Metropolitan Loop.

These supplementary major regional routes have been grouped under five geographical sectors which are bounded by the principal waterways of the Region. They are very briefly described below under such headings. At the end of each description is a reference to the atlas sections of the Graphic Plan upon which the route appears.

Between Atlantic Ocean and Raritan River

(S–1) Connects Route 18 at Hightstown (outside of the Region) with Route B–1, west of New Brunswick, which latter route is at this point a parkway and boulevard route along the Raritan River. It forms a westerly by-pass around New Brunswick. Sections 88, 91, 86, 89, 67.

Between Raritan River and the Pequannock-Pompton-Passaic Rivers

(S–2) Connects Route B at Perth Amboy with Route 17 at Rahway, by-passing Woodbridge on the east. Section 68.

(S–3) Extends alignment of Route 15 across Route A west of Connecticut Farms and joins Route "g" south of Newark. Sections 66, 69.

(S–4) Connects Route B at Morristown with Route "g" south of Newark, passing through Madison, Chatham and Irvington. Sections 43, 65, 66, 69.

(S–5) Connects Route 13 at Pine Brook with Route "k" at Belleville. Sections 44, 47.

(S–6) Connects S–5 at Montclair with Route "k" at Nutley. Section 47.

(S–7) Connects Route III at South Paterson with Route "k" at Belleville, passing through Clifton and Passaic. Sections 45, 47, 48.

(S–8) Beginning at the intersection of Route II and Route "h" this route terminates at the Dundee Dam on the Passaic River above Clifton. Sections 47, 45.

Between Pequannock-Pompton-Passaic Rivers and Hudson River

(S–9) Connects Route I in Newark and Route "c" in Jersey City. Section 70.

(S–10) Continues S–5 at Belleville, crosses the Hackensack meadows and connects with Route I. Sections 47, 48, 70.

(S–11) Extends S–6 across the Passaic River, crosses the Hackensack meadows diagonally and connects with Route "d." Sections 47, 48.

(S–12) Connects S–7 at Passaic with Route "d," Jersey City. Section 48.

(S–13) Continues S–8 across the Passaic River and the Dundee Dam, meets the intersection of the Saddle River Parkway and Route III at Rochelle Park, joins Route A north of Hackensack which it follows for about a mile, then strikes off northeasterly between Bergenfield and Dumont and finally connects with Route 9 in Rockleigh. Sections 45, 46, 49.

(S–14) A connection between Route A, north of Paterson, with Route 11 at Midland Park. Section 45.

(S–15) Connects Route 11 at Southfields with Route C at Harriman. The general northeasterly alignment is carried on by C–2 toward Newburgh. Sections 21, 3.

Between Hudson River and Long Island Sound (excluding Manhattan)

(S–16) Connection between Route 7 at Fordham Road and Route 8 in Yonkers by way of Sedgwick Avenue, Bailey Avenue, Broadway and Valentine Lane. Sections 51, 49.

(S–17) Short connection along Fordham Road between Routes 7 and 6–B. Section 51.

Manhattan and Staten Island

(S–18) Short connection from Dyckman Street Ferry to Route 7 at Fordham Road, by way of Dyckman Street, Nagle Avenue, Tenth Avenue, West 207th Street and University Heights Bridge. Section 51.

(S–19) Connection from Fifth Avenue to and across Queensboro Bridge by way of 57th Street and Second Avenue. Section 51.

(S–20) Connection from the Bowery along Schiff Parkway to Williamsburg Bridge. Section 73.

(S–21) Beginning at Route I, Manhattan Bridge, this route extends along the Bowery and Fourth Avenue to Park Avenue where it joins a boulevard route. Sections 73, 51.

(S–22) Beginning with Route I at Canal Street, this route extends along Sixth Avenue, Broadway and across the Harlem River to join with S–16. Sections 70, 73, 51, 49.

(S—23) Connection on Staten Island, along Forest Avenue and Richmond Turnpike, between Route A and Routes "a" and "b" at the St. George Ferry. This is part of the main route between the Goethals Bridge and the ferries to Manhattan and Brooklyn. Section 70.

Long Island

(S–24) Begins at Route "e," Jackson Avenue, connects with S–19 at Queensboro Bridge approach, continues along Jackson Avenue and Northern Boulevard to Flushing Bay; thence southeasterly along the old Stewart Railroad right-of-way, finally connecting with Route 2 at the Metropolitan Loop. Section 73, 51, 52, 74.

(S–25) Continues S–20 from Williamsburg Bridge and includes South Fourth Street, Grand Street, Bushwick Avenue and Pennsylvania Avenue to Route I. A new right-of-way is proposed to round off the right angle turn at Grand Street and Bushwick Avenue. Section 73.

(S–26) A connection between Route I and Route 2–A roughly parallel to the Long Island Railroad. It passes along Atlantic Avenue, 97th Avenue, Liberty Avenue, 109th Avenue and Hollis Avenue. Section 74.

(S–27) A Brooklyn-Queens route connecting the Metropolitan Loop at Fort Hamilton with parkway and boulevard route No. 35, following Seventh Avenue, Fort Hamilton Parkway, Caton Avenue and Linden Avenue to Kings Highways. Sections 72, 70, 73.

(S–28) Connects Route I and Route A–1 along Flatbush Avenue between Atlantic Avenue and Kings Highway. Sections 73, 75.

(S—29) Connects Queens Boulevard with Route A-1 along Woodhaven Boulevard and Jamaica Bay Boulevard to Rockaway. This forms the main approach from all the central areas of New York City to the extensive public beaches on the Rockaway Peninsula. Sections 74, 76.

Minor Regional Routes

The minor regional routes have already been defined as those which would supplement the major regional routes so as to facilitate traffic movement within the various sectors of the Region. Such highways are not shown on Pocket Map No. 2 but will be found on the Graphic Regional Plan. The locations shown are merely suggestive and the actual positions and lines of these connections should be determined by the county or local authorities of those districts through which they pass. Those classified as boulevards or parkways have been shown in Fig. 20 (page 273) and briefly described. The most important general highways of the minor regional routes have been selected and listed in tabular form below, grouped under geographic sectors similar to those used in listing the supplementary major routes. There seems to be no necessity for a detailed description of such routes. The table gives for each route its approximate length, the portion which is shown over a new right-of-way, its general location and the atlas sections of the Graphic Plan upon which the route appears.

Route number	New right-of-way, miles	Total length, miles	Beginning	Passing through or along	Ending	Appears on Atlas sections	Remarks
				Between Atlantic Ocean and Raritan River			
M-1	½	43½	Route C at Rocky Hill	Hightstown, Freehold, Eatontown	Long Branch	85, 87, 88, 91, 92, 95, 96	Partly outside of Region.
M-2	—	12½	Kingston	Tenmile Run, Franklin Park	New Brunswick	86, 89	Portion of Lincoln Highway.
M-3	1	25½	New Brunswick	Old Bridge, Matawan, Holmdel, Colts Neck	Border of Region	89, 90, 93, 95	
M-4	—	5½	South River	Sayreville	South Amboy	89, 90	
M-5	—	7	Route 20 south of Keansburg	New Monmouth, Atlantic Highlands	Route B, Highlands of Navesink	93, 94	
M-6	—	4½	South Bound Brook	Raritan River	New Brunswick	64, 67	Borders the proposed Raritan River Parkway.
				Between Raritan River and the Pequannock-Pompton-Passaic Rivers			
M-7	2	30	Two miles west of North Branch	Bound Brook, Plainfield, Cranford, Elizabeth	Newark	63, 64, 67, 65, 66, 69	By-passes Raritan and Somerville.
M-8	—	6½	Route 15, east of Lamington	Pluckemin	Parkway and boulevard route No. 3	61, 62	
M-9	7½	17	Route 16 west of Bound Brook	South Bound Brook and Metuchen	Perth Amboy	64, 67, 68	Coincides with Route B for about a mile.
M-10	9	21	Highland Park	Metuchen, Rahway, Cranford, Springfield	Maplewood	89, 67, 68, 66	Includes part of Lincoln Highway.
M-11	9½	17½	Raritan Landing	South Plainfield, Goodmans, Roselle	El Mora	67, 68, 66, 69	
M-12	—	10½	Perth Amboy	Woodbridge, Rahway	Elizabeth	68, 66, 69	
M-13	11½	16½	Perth Amboy	Carteret, Elizabeth	Newark	68, 71, 69	Runs parallel to Central Railroad of New Jersey.

Route number	New right-of-way, miles	Total length, miles	Beginning	Passing through or along	Ending	Appears on Atlas sections	Remarks
			BETWEEN RARITAN RIVER AND THE PEQUANNOCK-POMPTON-PASSAIC RIVERS—(*Continued*)				
M–14	—	6½	Route "h" west of Springfield	Springfield, Connecticut Farms, Townley	Elizabeth	66, 69	
M–15	2	19	Wheatsheaf	Roselle, South Orange, East Orange, Bloomfield	Passaic	66, 69, 47, 48	
M–16	4	20½	Route 15, west of Berkeley Heights	Stanley, Livingston, Caldwell	Little Falls	65, 66, 44, 47, 45	
M–17	—	28½	Ledgewood	Morristown, Cheapside, South Orange	Newark	37, 39, 40, 43, 44, 66, 69	
M–18	½	10½	Morristown	Stanley and Summit	Springfield	43, 65, 66	
M–19	2	7½	Branch Mills	Springfield and Millburn	Northfield	66, 44	
M–20	½	13	Southwest of Elizabeth	Lyons Farms, Newark, Bloomfield	Montclair	69, 47	
M–21	4	16½	Lyons Farms	Irvington, Belleville, Nutley, Athenia	Paterson	69, 47, 45	
M–22	1	18	Chester	Dover, Spicertown, Berkshire Valley, Hurd	Woodport	39, 40, 38	Coincides with Route 13–B for about a mile.
M–23	3	11½	Mine Hill	Union, Littleton	Whippany	38, 40, 43	By-passes Dover on the south.
M–24	—	18½	South Mountain Reservation	St. Cloud, Cedar Grove, Mountain View, Pompton Plains	Riverdale	44, 47, 45, 42	In preceding sector for about two miles.
M–25	1½	22	South of Morristown	Morristown, Mt. Tabor, Powerville, Montville, Lincoln Park	Mountain View	43, 41, 42	Passes north of Boonton.
			BETWEEN PEQUANNOCK-POMPTON-PASSAIC RIVERS AND THE HUDSON RIVER				
M–26	½	19½	Southern Jersey City	North Bergen, Ridgefield, Englewood	Closter	70, 48, 49, 51	
M–27	½	11	Jersey City	Weehawken, West New York, Cliffside Park	Fort Lee	70, 48, 51	
M–28	2	10½	Kearny	Along Passaic River	Clifton	69, 47, 48, 46, 45	1½ miles are in preceding sector.
M–29	7	12	Kearny	Western part of Hackensack meadows, Little Ferry	Hackensack	48, 46	
M–30	½	15	Harrison	Kearny, Lyndhurst, Woodridge	Hackensack	69, 47, 48, 46	
M–31	4	17½	Garfield	Fairlawn, Ridgewood, Allendale	Suffern	48, 46, 45, 24, 23	
M–32	4	26	North Bergen	Ridgefield Park, Harrington Park, Tappan, West Nyack	Waldberg Landing	48, 46, 49, 27, 25	
M–33	—	7	Arcola	Hackensack, Teaneck	Englewood	46, 49	Secondary approach to Fort Lee Bridge.
M–34	½	9½	Glen Rock	Paramus, New Milford, Dumont, Cresskill	Alpine	46, 49	One mile passes through proposed park.
M–35	4	8	Paramus	Riverside and Englewood	Englewood Cliffs	46, 49	An approach to Engelwood-Dyckman Street Ferry.
M–36	—	7	Haledon	North Haledon, Franklin Lakes	Oakland	45, 23	

Route number	New right-of-way, miles	Total length, miles	Beginning	Passing through or along	Ending	Appears on Atlas sections	Remarks
			BETWEEN PEQUANNOCK-POMPTON-PASSAIC RIVERS AND THE HUDSON RIVER—(*Continued*)				
M-37	1	7	Hillsdale	Old Tappan	Sparkill	24, 27	
M-38	½	11½	Pompton Lakes	Wanaque, Midvale, east side of Wanaque Reservoir	Route C-1 north of the Reservoir	42, 20, 18	Parallels Greenwood Lake Division of the Erie Railroad.
M-39	1½	12½	Monroe	Washingtonville, New Windsor	Border of Region	3, 1	
M-40	—	9	Route C east of Central Valley	Long Pond	West Point	4, 2, 5	Partly in Palisades Interstate Park.
			BETWEEN THE HUDSON RIVER AND LONG ISLAND SOUND (EXCLUDING MANHATTAN)				
M-41	—	10	Cold Spring	McKeel Corners	Route C-2 west of Mead Corners	5, 6	
M-42	2	7½	Bear Mountain Bridge	Garrison	Albany Post Road at Nelson Corners	7, 5	Approach from the north to Bear Mountain Bridge.
M-43	—	27	Buchanan	Peekskill, Mohegan, Mahopac, Carmel	Boundary of Region	7, 8, 11, 9	
M-44	—	22	Peekskill	Yorktown, Somers, Salem Center	North Salem	7, 8, 11, 12	
M-45	1½	12½	Yorktown	Tompkins Corners	Route C-2 west of Mead Corners	8, 6	
M-46	—	16	Broadway and 230th Street in The Bronx	Yonkers, Hastings, Dobbs Ferry, Tarrytown	North Tarrytown	49, 27, 28	Uses Riverdale and Warburton Avenues.
M-47	—	14½	138th Street in The Bronx	Along the Harlem Division of the New York Central Railroad to Mt. Vernon, Bronxville	Scarsdale	51, 50	Parallels Bronx River Parkway above Bronx Park.
M-48	½	8½	Dobbs Ferry	Ardsley, Scarsdale	Mamaroneck	28, 50, 53	
M-49	5½	8½	Hastings	Crosses Grassy Sprain Reservoir and Upper Tuckahoe Reservoir	Larchmont	49, 50	
M-50	12	39	New Rochelle	Parallels Boston Post Road on north side to Darien, on south side through Southport	Bridgeport	50, 53, 31, 32, 35, 36, 34	
M-51	—	11	New Rochelle	Larchmont, Mamaroneck, Rye	State line beyond Port Chester	50, 53, 31	
M-52	1	4½	Port Chester	Around Port Chester	M-50 east of Glenville	53, 31	
M-53	1	21½	Route B in Yonkers	Elmsford, Pleasantville and Chappaqua	Mt. Kisco	49, 50, 28, 26, 29	Furnishes general traffic route along Saw Mill River Parkway.
M-54	1½	20	Route 8 north of Ossining	Chappaqua, along Westchester-Fairfield County boundary	Port Chester	26, 29, 31	
M-55	1	19½	Scarboro	Millwood, Pine Bridge, Somers	Croton Falls	26, 29, 11	
M-56	½	21	Greenwich	Banksville and Bedford	East of Poundridge Reservation	32, 31, 29, 30, 12	
M-57	2	15½	Stamford	New Canaan, Lewisboro	Route 6 southwest of Ridgefield	32, 35, 33, 30, 12	

Route number	New right-of-way, miles	Total length, miles	Beginning	Passing through or along	Ending	Appears on Atlas sections	Remarks
			BETWEEN THE HUDSON RIVER AND LONG ISLAND SOUND (EXCLUDING MANHATTAN)—*(Continued)*				
M-58	—	15½	Norwalk	Winnipauk, Wilton, Georgetown	Route 6 northeast of Ridgefield	35, 33, 15	Coincides with M-59 for a mile.
M-59	½	22½	Westport	Wilton, Ridgefield, North Salem	Route C-2 east of Brewster	34, 33, 15, 12, 10	
			MANHATTAN AND STATEN ISLAND				
M-60	—	2½	Park Row at Vesey Street	East Broadway, Essex Street, Avenue A	Route "b" at 24th Street	70, 73	Also a branch south on Rutgers Street to Route "b."
M-61	—	7½	Route "b" at East River	Pike Street, Allen Street, First Avenue	M-47 at Harlem River	73, 51	
M-62	—	7	Manhattan Bridge Plaza	Chrystie Street, Second Avenue	Harlem River	73, 51	
M-63	—	10	Bowery at East Fifth Street	Third Avenue, Westchester Avenue	Route A in The Bronx	73, 51	
M-64	¼	7½	Park Row at City Hall	Lafayette Street, Broadway, Irving Place, Lexington Avenue	Harlem River	73, 51	It is proposed to connect Irving Place with Lexington Avenue, under, over or through Gramercy Park, also to continue Irving Place southerly to Fourth Avenue.
M-65	¼	6	Broadway at 20th Street	Madison Avenue	Harlem River	73, 51	
M-66	¼	7½	Canal Street	West Broadway, Fifth Avenue	Harlem River	70, 73, 51	
M-67	—	3	Broadway	Sixth Avenue, through Central Park, Lenox Avenue	Harlem River	51	Mileage does not include road in Central Park.
M-68	—	2½	Canal Street	Varick Street, Seventh Avenue	Broadway at 42d Street	70, 73, 51	
M-69	—	9½	Cortlandt Street	West Broadway, Hudson Street, Eighth Avenue	Harlem River	70, 73, 51	
M-70	—	6	M-69 on Hudson Street	Ninth Avenue, Columbus Avenue	Amsterdam Avenue at West 122d Street	70, 73, 51	
M-71	—	9½	Route "a" at West 14th Street	Tenth Avenue	St. Nicholas Avenue near Dyckman Street	70, 48, 51	
M-72	—	4½	Route "a" at West 22d Street	Eleventh Avenue, West End Avenue	Broadway at 107th Street	70, 48, 51	
M-73	—	4½	Lenox Avenue at Central Park	St. Nicholas Avenue	Dyckman Street	51	
M-74	6	12	Route 18 south of Fresh Kills	Parallel to shore of Arthur Kill, Kill van Kull	Routes "a" and "b" at St. George Ferry	71, 69, 70	
M-75	—	7½	Carteret Ferry	Richmond Turnpike	Route S-23	71, 72, 70	Coincides with Route 18 for two miles.
M-76	—	7½	Hylan Boulevard below Great Kills	Richmond Avenue	Routes "c" and "d" at Kill van Kull Bridge	71, 69	
M-77	—	7	Route 19 at Great Kills	Amboy Road	Routes "a" and "b" at Stapleton	71, 72	

Route number	New right-of-way, miles	Total length, miles	Beginning	Passing through or along	Ending	Appears on Atlas sections	Remarks
				LONG ISLAND			
M-78	½	5	Proposed bridge to 86th Street, Manhattan	Astoria, Woodside	Proposed boulevard south of Corona	51, 73, 74	
M 79	—	7½	Route "e" on Greenpoint Avenue	Woodside, Corona	Route III, Flushing	73, 74, 52	
M-80	1	5	Proposed tunnel at Houston Street	Metropolitan Avenue	Route II	73	
M-81	—	7	Brooklyn Bridge	Flushing Avenue, Grand Avenue	M-78	73	
M 82	—	9	Court Street	Myrtle Avenue, Hillside Avenue	Route II	73, 74	
M-83	—	20	Empire Boulevard at Prospect Park	Jamaica and Mineola	Route 3 east of Route B	73, 74, 77, 55, 56	
M-84	½	9	Grand Central Parkway	Union Turnpike, Marcus Avenue	M-83 west of Mineola	74, 77, 55	
M-85	5	33½	Eastern Parkway, near Kings Highway	South of Jamaica, Hempstead, Farmingdale	Babylon	73, 74, 77, 78, 81, 82	
M-86	1	37	Route A south of Whitestone	Jamaica, Rockville Center, Amityville, Babylon, Bayshore, Islip	Route 1 at Great River	52, 74, 77, 78, 81, 82	East of Jamaica this follows the Merrick Road.
M-87	—	6½	Atlantic Avenue	Rockaway Boulevard	Route A-1	74	
M-88	½	7	Gravesend Bay	Eighteenth Avenue, Avenue D and Ditmars Avenue	Linden Boulevard	72, 75, 73	
M-89	10	14½	Route A	86th Street, Avenue U, parallel to Jamaica Bay shore	Route A-1 at Springfield Boulevard	75, 73, 74	
M-90	—	4	Liberty Street at Brooklyn Bridge	Court Street, Hamilton Avenue, Prospect Avenue	Ocean Parkway	73	Hamilton Avenue west of Court Street is shown as a branch connecting with the ferry to Manhattan.
M-91	—	6	Flatbush Avenue	Along Sixth Avenue, around westerly border of Greenwood Cemetery, New Utrecht Avenue	Route A	73, 70, 75, 72	
M-92	—	7½	Route "e"	Washington Avenue, Empire Boulevard, Ocean Avenue	Sheepshead Bay	73, 75	
M-93	—	9	Laurel Hill Avenue at Northern Boulevard	Laurel Hill Boulevard, Meeker Avenue, Roebling Street, Bedford Avenue	Flatbush Avenue	51, 73	
M-94	½	7½	Route "e"	Union Avenue, Marcy Avenue, New York Avenue, Nostrand Avenue	Route A	73, 75	

Route number	New right-of-way, miles	Total length, miles	Beginning	Passing through or along	Ending	Appears on Atlas sections	Remarks
				LONG ISLAND—(*Continued*)			
M–95	—	7	M–79	Kingsland Avenue, Bushwick Avenue, Stuyvesant Avenue, Utica Avenue	Route "f"	73	
M–96	—	3	M–95 at M–83	Remsen Street	M–89	73	
M–97	½	6	Route "f"	58th Street, Betts Avenue, easterly side of Long Island Railroad, Fresh Pond Road, Cypress Hills Road, Chestnut Street	Route I	51, 73	
M–98	1½	3	Route III	108th Street	Queens Boulevard	52, 74	
M–99	4	6½	Classon Point-College Point Ferry	Along Flushing Bay, Flushing Creek	Queens Boulevard at Maplewood	52, 74	
M–100	—	10	Route A, Whitestone	Bayside, Queens Village	Route A	52, 74, 77	Coincides with 2–A for one-quarter mile.
M–101	—	10½	Route 4, Douglaston	Floral Park	Route A–1 at Jamaica Bay	55, 77	
M–102	—	11½	Kings Point	Great Neck, Kensington, Hyde Park, Franklin Square	Southern State Parkway north of Valley Stream	52, 55, 77	Alignment is continued by a proposed parkway to Long Beach.
M–103	2	25	Sands Point	Along Manhassett Neck, Garden City, Lynbrook, Lawrence	Long Beach	55, 77, 79	
M–104	1	17½	Glen Cove	Jericho, Central Park, Massapequa	M–86 at Seaford	55, 56, 81	By-passes Hicksville on the east.
M–105	—	15	Glen Cove	Locust Valley, Oyster Bay, Syosset	M–104 east of Hicksville	55, 54, 56	
M–106	½	17½	Huntington	Woodbury, Hicksville, Bellmore	South Shore boulevard loop	59, 56, 78	
M–107	½	14	Route 4 south of Northport	Deerpark	M–86 at Babylon	58, 60, 82	

RELATION OF THE GENERAL PATTERN OF MAJOR HIGHWAYS TO EXISTING OR OFFICIALLY PROPOSED HIGHWAYS

In the preceding description of highway proposals some reference has been made to the official status of certain sections of the routes. It will be noted that the greater proportion of those proposals on the Plan relating to what have been called general highways, has followed the lines of the highways that already exist or have been officially adopted by the public authorities. In other words, the proposals consist, to a very large extent, of suggestions for improving the existing or mapped highway system, which has been followed in preference to showing new lines wherever it conforms to what is conceived to be a sound system of road communication in any part of the Region.

This has been done with a view to avoiding the difficulties of making changes in the direction of existing or officially mapped lines. When, however, improved traffic facilities must be provided on some of these highways, cases will probably be found where it is more economical and less difficult to acquire land for new routes over considerable lengths than to widen those that exist. In any event short changes of line will suggest themselves as improvements in the many cases where straightening or a reduction in grades are found to be desirable.

One feature that will have to be considered in connection with the desirability, or otherwise, of changing to a new line of road will be the effect which such a change will have on the values of property abutting on both sides of the existing and proposed roads. For instance, owners of land adjoining an existing highway may suffer serious injury by the diversion of traffic along a new route, or they may, on the contrary, be benefited as a result of the diversion. Where the injury is small, or where there is a benefit, and the land for the new line of highway can be acquired at a reasonable cost—due regard being paid to the effect of the levels on the cost of construction—there will be strong reasons for choosing a new line. This may occur even where the change is not dictated by the necessity of removing bad curves or grades. Whatever the effect of such a choice may be on the existing highway, it will convert back land into front land and create new values along the sides of the new highway, and this will be an element to set against its cost of construction. On the other hand it is not always the case that widening an existing road makes the frontage land more valuable—indeed in some cases it makes it less valuable than before the widening. The merits of each case can only be determined in each locality when the improved road is definitely planned.

Where the capacity of the existing roads needs to be considerably increased or where their frontages are occupied by existing buildings, it will usually be found more economical to purchase land for a new right-of-way. Where it is important to segregate traffic, this can only be done successfully by building special roads under regulations defining their use. This latter is an important factor in favor of developing new routes as compared to widening existing highways.

Then again, on existing highways there is serious difficulty in separating grades at junctions because nearly every cross road has caused some building development to take place and has increased land values over what they are on other land fronting on the highway. Consequently it is difficult and expensive to build bridges and subways at the junctions of existing highways. This difficulty and expense are lessened in connection with highways built on what is now back land. It is lessened not only because of the absence of buildings but also because, by planning the highway in advance and in conformity to the levels of the land, the position of bridges and underpasses can be determined in the most economical places and the necessary property acquired, even though grade separations are not immediately justified.

FIG. 21

Whether or not new lines are desirable, it has been thought expedient in the Regional Plan to show the maximum amount of utilization of the existing system of highways. In the preceding description of parkways and boulevards, however, it

was pointed out that, in constructing new parkways, the greatest benefits are obtained if they are constructed along entirely new routes.[1]

The absence of more original features in many parts of the highway system does not mean that lines have been adopted without careful study or that the Plan to any large extent is merely a compilation of existing lines and proposals. All roads have been carefully studied and the new lines that are shown have an importance which is all the greater because they are not large in number. Merely to assemble many proposals that have been made for improving the existing highway system is a valuable service to the highway authorities who operate in different parts of the Region. This service is added to when new links in the chain of communications are placed in positions where they are most needed. Perhaps, however, the most valuable result of making a regional plan of highways, when considered alone, is that it classifies all the highways in different types and thereby, as well as in diagrammatic presentation, shows their relative urgency and importance.

An attempt has been made in Fig. 21 to show, in regard to those highways forming parts of the general pattern of routes, which ones follow streets either now existing or officially adopted and which are on rights-of-way that as yet have no legal status. The map includes all the routes shown in Fig. 12 (page 219) and, in addition, the major parkway and boulevard routes which supplement them. All general highways are shown in black and all parkway and boulevard routes in green. The new routes of the general highway type are seen to represent a small minority. In some cases those shown in full lines on this map are not paved, and in a good many cases they should be considerably widened before they can adequately serve the part indicated for them in the Graphic Regional Plan. It was impracticable to specify those highways which must be widened or straightened, but some illustrations are given on the preceding pages[2] of certain types of cross sections that are recommended.

Financial Considerations

How the Cost of Highways is Met.—The proposed system of highways, including parkways and boulevards, can only be carried out by state, county and municipal co-operation. The need for greatly extended highway facilities and improved construction of the surfaces is creating a financial situation that is requiring the exercise of the wisest statesmanship on the part of members of public authorities.

The proposals shown on the Graphic Regional Plan can only be carried out over a period of many years. The limits of expenditure which can be incurred by public authorities will be the controlling factor in determining the program of construction, which will involve immense costs. The fact that the cost of carrying out an adequate plan of highways is bound to be great in any event, makes it all the more

[1] See page 271.

[2] See pages 226, 261, 268 and 270.

important that the systems be planned in advance and that all construction should proceed in accordance with a well-conceived program leading gradually towards the achievement of the complete plan. The same fact is of importance in connection with the question of obtaining increased revenues from the land served by the improved highways.

Highways and parkways, as well as railroads and subways, should be made as self-sustaining or revenue-producing as possible. In the case of highways it is no longer customary to make a direct toll charge for their use, with the exception of special cases of bridge and tunnel connections. Highways and streets, however, have been and will continue to be constructed largely at the expense of owners of abutting property and in that sense the cost of them is assessed to a large degree on property benefited. It is obvious, therefore, that the degree to which highways improve values of abutting property is an important element in making their construction economically sound.

The three ways in which a municipality can obtain revenues to construct highways are by general taxation, by special taxation of property benefited, and by special taxation of the users of the highways. Where the construction of highways adds to the value of abutting land and thereby increases its taxable value, the community may derive increased income as a result of the improvement in addition to any direct contribution it receives from owners. Where the motor car obtains the benefit of improved means of communication, it is proper that it should contribute towards the cost of the improved facilities. From these two sources of increased income it would be possible, if it were practical to adjust taxes equitably according to benefits received, to make highways profitable to a municipality.

Many years must elapse before the land fronting on new and improved highways intersecting open territory can be profitably used for business, and in some cases this applies also to residence if the highway intersects an area where no immediate demand for residence exists. In the case of Eastern Parkway in Brooklyn it was a generation before the contiguous territory responded in value or development to the type of the improved highway. In planning new highways it is important to consider their effect in promoting or retarding the development of abutting land for its most appropriate and most profitable uses.

Even were everything done to promote increased values, the question will still remain whether the automobile should not pay a greater proportion toward the construction of the facilities that are demanded for its use. It is apparent that, in addition to the increased use of a gasoline tax,[1] the taxes on automobiles are being indirectly increased in charges for use of toll bridges and tunnels. The time may come when more of the cost of those highways for the use of which no toll can be levied will have to be paid for by higher taxes on vehicles.

[1] New York State adopted a tax on gasoline of two cents per gallon under a law passed in March, 1929, effective May 1.

Highway funds from general taxation may be obtained by the issuance of bonds which will be amortized over a period of years, by special appropriations from current revenues, or from a general tax levy for highway purposes. The last method has been employed successfully in Detroit and the adjoining counties in carrying out a master highway plan adopted in April, 1925. In this case the Common Council of the City of Detroit ordered the inclusion in each annual budget of an amount equal to one mill on the total assessed valuation of the city for the purpose of carrying out the plan. Highway rights-of-way outside the city are being financed by a maximum half mill general property levy within the counties of Wayne, Oakland and Macomb.

A considerable proportion of highway rights-of-way through undeveloped areas can often be obtained through a dedication by property owners without charge to the municipality or other public agency constructing the highway. Such dedication may be either voluntary or by a requirement that any subdivision maps for the areas through which the highways pass will be accepted only if they provide for the highway as laid out by the public authorities. If such routes are part of a carefully prepared and comprehensive plan local property owners with vision should be quick to see the benefits which will accrue to themselves by co-operating to this extent toward the construction of the highways. In the neighborhood of Detroit over 200 miles of rights-of-way for the super-highway system were dedicated within the first two years after the master plan was adopted.

Highways and Land Values.—The relation between highways and land values may be illustrated by what is happening in different parts of New York State. In some cases large sums have been borrowed to construct new concrete highways through areas that are not in demand for residential development and where there is no immediate prospect that the frontage of the new highways will be required for business. Nevertheless the land abutting on the highways is assessed as potential business property. This increased assessment may represent the very considerable difference between acreage prices and the high prices of foot frontage for a business street and create an intolerable hardship for the owners. Their land is assessed and taxed on the basis of a use to which it cannot be put until after extensive areas of back land are built upon with residences. The development of this back land may be suspended for such a lengthy period that the taxation of the land assessed for business destroys the equity of the owner.

A different case is that of Westchester County, where the improvement of existing highways, primarily adaptable for mixed traffic and serving business uses of the land through which they pass, is paralleled with the construction of an extensive series of parkways. The parkways have been found to be a strong magnet in attracting new residential growth and thereby have enormously increased land values. In this respect they differ from the ordinary type of arterial highway. The ultimate

effect of the development of parkways is to create the amount of residential growth necessary to make prosperous business areas at junctions with arterial highways, and to stimulate business use of the land along highways that are parallel with the parkways.

What has been said indicates the need for securing increased revenues to the public authorities as both a direct and an indirect result of building new road communications and how essential it is that the planning of new highways should be based on the soundest economic lines. This does not mean only that they should be economically planned and constructed, but also that they should have in view the increase in the value of land which they serve. An arterial highway may increase values in an industrial area by providing improved access to major transportation facilities or to a market. It is necessary, however, for deliberate design to enter into the question of constructing such highways in industrial sections. No haphazard development is likely to make it economical to build highways of the type suitable to serve an industrial district without their being part of a comprehensive plan of an industrial area.

A highway may also increase values in a business area by providing access to and from surrounding residential areas. The frontage of well paved highways near to cities is usually regarded as having a value for business purposes. Since the coming of the motor car, however, so much good pavement has been constructed in urban areas that there is now many times the road frontage available on good highways that there was only a few years ago. An important problem today is how to make profitable use of the greatly extended area of land abutting on main highways.[1] The problem cannot be solved by saying that such land is more adaptable for one thing than for another. To a large extent it has practically ceased to be desired for residence. More and more people want to build their houses, or live, away from the main highway. But inasmuch as the greatest demand for land is for residence, and as the business area cannot be developed without a residential population in its neighborhood, it is important that more roads be planned and built in a form that will attract residence.

In the description of land uses[2] it will be seen that a conservative estimate of the demand that arises for land for building purposes is that not less than 75 per cent of the demand will be for residential uses. This being the case it follows that any constructive scheme of highway improvement should take into consideration the question of the kind of arterial road that will best serve the needs of residence, together with incidental recreational needs, as well as give facilities for fast vehicular traffic. Observe that reference is made here to the financial and not to the social or æsthetic values of particular types of arteries.

Apart from the fact that the greatest demand for land along the edges of highways is for residential use, it is usually the case that the best situations for business

[1] See also Chapter I, page 141.

[2] See page 331.

are at the main junctions of roads. The modern arterial highway has become very like a railroad in the respect that it separates rather than unites neighborhoods. On railroads business concentrates around stations. The main junctions of the highways, especially if they have separated grades, correspond to the local railroad station. Now that road travel is more speedy than it used to be with horse-drawn vehicles, distances have entirely changed. Whereas business use formerly expanded from the center along the main highways in a series of corridors or wedges, it shows an increasing tendency to develop in spots where the combination of a highway and a railroad station create a sub-center and in some places where only a road junction exists.

From many points of view it is evident that in building new arterial roads the planner must have in view the encouragement of residential rather than commercial growth between the important junctions or strategic points in the highway system. An important exception would be where the roads passed through an industrial area and another might be where it formed an extension immediately outside an existing city or village where more business was needed to meet the needs of an existing or prospective population. Generally speaking, however, the construction of parkways and the conversion of some highways into boulevards is the most economical way to supplement the existing highway system.

Economy of Parkways.—Parkways have proved to be the most economical type of road from the point of view of creating revenues, because they have attractive park strips along each side of the road, outside of which great increases take place in the value of land.

As already stated, the parkways in Westchester have created enormous values on the edges of the parks. The areas between strategic points and main intersections have proved highly adaptable for residence, while areas adjacent to intersections are being developed for business centers.

The parkway is particularly appropriate for the kind of traffic that serves residential areas because it is confined to passenger automobiles. Segregation is most feasible when roads run through parks, as the ordinary highway is not readily limited to the use of one class of vehicles. The provision of facilities for recreation in accessible places along the parkways makes it possible to secure revenues from the park areas to help to pay for the construction of the roads. It is interesting to note that in Westchester most of the revenues are derived, not from road uses, but from the public golf courses, athletic fields, bathing facilities and an amusement park which occupy areas of land adjacent to the parkways.

This shows that the acquisition of additional areas for recreation along the sides of parkways does two important things: First, these strips add to the attractiveness, for residential purposes, of the area through which the parkway runs; and second, they give the users of the parkway a recreational objective other than that afforded

by mere driving. Both these things have a money value in increasing assessments of land and in creating direct revenue. All this has been proved in Westchester County.

In the Report of the Westchester Park Commission for 1928, it is shown that the net budget for operation and maintenance was reduced from $468,585 to $287,606,

Courtesy, Westchester County Park Commission

BRONX RIVER PARKWAY

It is not surprising that land values would be affected favorably by such an improvement as these pictures indicate. The upper picture was taken at a point near Mount Vernon before improvement; the lower picture is the same view after the parkway was constructed.

and the income from rentals and concessions was increased from $60,944 to $462,518. During the three years before the creation of the park systems, the assessed valuations of real estate increased from about $675,000,000 to about $790,000,000 in 1923; whereas during the next four years, 1924 to 1927 inclusive, immediately after the creation of the system the values increased to well over $1,300,000,000. These figures have as much bearing on the question of extending parks as of constructing parkways and are therefore an argument in favor of the later proposals dealing with park systems.[1] But they are an element of great importance from the point of view of economy in constructing highways so that they will be indirectly profitable and not a growing burden to communities.

Widths of Parkways.—It should be noted that where the width of a parkway is limited to 160 feet, the strips of park on both sides are so narrow that it is almost certain to become simply a boulevarded highway. It is necessary in some cases, and not undesirable, that short lengths of parkway be no more than 160 feet in width. Wherever it is possible, however, parkways should be widened out to 500 feet, 1,000 feet, or more, so as to provide those recreational areas that indirectly help to make the parkway a paying proposition.

It is a sound financial policy to acquire land for a parkway in various widths. The parks along a parkway cannot be acquired at a cheap rate if an attempt is made to get the same width throughout. Pieces of land that are most adaptable for parks, and can be had at reasonable cost, can usually only be acquired in spots.

New Parkways versus Widening Existing Highways.—With a view to obtaining an approximate estimate of the comparative cost of constructing new parkways and widening of existing highways, a question on this subject was addressed to Mr. Jay Downer, Chief Engineer of the Westchester County Park Commission, asking whether data were available to permit of such a concrete comparison. Mr. Downer's reply was that it was difficult to equate all the variables, but that there were data at hand, based on experience in Westchester, sufficiently tangible to demonstrate the advantages of a broad parkway through new territory as opposed to widening old roads. The following is a copy of Mr. Downer's report.

WIDENING BOSTON POST ROAD VERSUS NEW PARKWAY

The Boston Post Road, and also the Albany Post Road, were established pursuant to the "Publick Highways Act" of 1703 prescribing the width as "four rods English," or 66 feet. Doubtless they were for many years scarcely more than a single wagon track in width with the sidelines vaguely defined.

Recently, in re-paving and widening the Boston Post Road, the varying actual widths are found to range from 66 feet or less to 80 feet or more. On January 10th, 1929, the county made an appropriation of $600,000 to acquire a stretch of land along the Post Road in Mamaroneck but this area involves trunk sewer and village park uses as well as a 20-foot strip for the highway, so that the allocation of the cost of the latter is rather complicated. A better comparison may be derived by framing a theoretical example of widening the road to 100 feet as opposed to making a new parkway, say 500 feet in

[1] See pages 336–355.

width. As a practical matter, it would be nearly as cheap to widen the existing road of say 66 feet, by a full lot depth of 100 feet.

A comparison will be drawn on this basis between the Boston Post Road and the Hutchinson River Parkway. A conservative valuation of land along the Post Road, averaging developed business sections with the remaining undeveloped old estates, would be $2.00 per square foot. The actual cost of lands now in the Hutchinson River Parkway, including quite a sprinkling of improved residential properties, was $4,000 per acre, or a little less than 10 cents per square foot. The comparison of right-of-way costs then is as follows:

Widening Boston Post Road to 166 feet.....100 feet @ $2.00 per sq. ft. = $1,056,000 per mile
New parkway 500 feet wide at Hutchinson
River Parkway, land price.....500 feet @ 10 cts. per sq. ft. = $264,000 per mile

As to right-of-way, the 500-foot parkway could be purchased at one-quarter the cost of widening the old road.

A still better example is afforded by a similar comparison of the Albany Post Road.

Widening Albany Post Road Versus New Parkway

A conservative assumption of values, taking into consideration a long stretch of the Albany Post Road, would be $1.50 per square foot. Along this road, business properties through the villages are valued as high as $5.00 per square foot and the remaining old estates between village centers south of Ossining are held at $10,000 or $12,000 an acre, or about 25 cents per square foot. From Ossining to Peekskill the average would be $5,000 per acre. The more southerly village groups, such as Dobbs Ferry, Irvington and Tarrytown, which are rapidly stretching out to form one continuous apartment and business frontage, would very likely bring the average cost over any considerable stretch of this road up to $1.50 per square foot.

In comparison with this we have the new Saw Mill River Parkway on which the average land cost was about $2,300 per acre or 5¼ cents per square foot. The comparison then is as follows:

Widening Albany Post Road to 166 feet.....100 feet @ $1.50 per sq. ft. = $792,000 per mile
New parkway 500 feet wide at Saw Mill River
Parkway land price.....500 feet @ 5¼ cts. per sq. ft. = $138,600 per mile

Here the right-of-way cost of widening the Post Road would be nearly six times that of a 500-foot parkway.

Grade Crossings

The cost of grade crossing eliminations is much lower on the parkways because they are fewer in number. The greater width of the parkway affords greater flexibility in design and the construction costs are likely to be lower both in the main structure and the drives or ramps between the two levels. The question of consequential damages to abutting corner properties may be a serious factor in the case of the old road but in Westchester County, at least, has been entirely avoided on the parkways.

A striking instance of the grade crossing difficulty is found in the study which was made of the suggested Riverdale-Warburton Avenue widening in Yonkers which you will find in the commission's 1927 report on page 51. In a distance of 4.57 miles, there are 22 intersecting streets and 19 through crossings. The cost of grade crossing eliminations or dead-ending these streets would be prohibitive.

Pavement

No exact comparison between the widened road and the new parkway can be drawn on grading and pavement costs. A given volume of traffic would require the same pavement width in either case.

Grading costs in many cases might run higher in the more rigid 100-foot strip and adjoining an old road than in the broad parkway where there is greater flexibility in the choice of location.

Accessory Service Streets

In order to develop abutting parkway frontages, paralleling service streets for mixed traffic are necessary. The cost of these streets is not, however, a material, if any, debit against the broad parkway. In Westchester County the parkways have been laid out with existing streets or roads utilized as boundaries for considerable distances, thereby involving no extra cost for accessory streets. Elsewhere these abutting service streets can be worked out as a matter of planning the subdivisions and secondary street systems in the vicinity of the parkways.

100-Foot Road Versus 500-Foot Parkway, Both in New Territory

In this comparison and assuming that the unit land cost will be no higher for taking only a 100-foot strip, the case against the 100-foot road rests principally on the negative effect on the large percentage of the frontage, which will be shunned by residential development on account of the heavy traffic and which cannot be absorbed by business or industrial development. The cost of right-of-way will be in the acreage class. If the cost be assumed as 5 cents per square foot, the difference in right-of-way cost between the 100-foot road and the 500-foot parkway would be, in round figures, about $100,000 higher per mile for the parkway. At 4 per cent interest and 50 years amortization, the carrying cost for the first year would be $6,000 and diminished from year to year. At a 3 per cent tax rate, it would be necessary to enhance property valuations about $200,000 per mile. Assuming an area 100 feet in depth on each of the frontages, an enhancement of 20 cents per square foot in land value would be necessary to establish the new valuation of $200,000. Actually the enhanced valuation is realized over a zone of much greater width than 100-foot depths on either side.

There must be large areas in various regions throughout the country in which parkways would enhance valuations sufficient to at least balance the account on a dollars and cents basis and in many instances the parkway would over-balance the account with profits in varying degrees. Aside from the financial aspect, the considerations of public health, welfare, convenience and general amenities are clear gain.

Multiple Utility of Parkways

One of the variables not susceptible of reduction to concrete figures even by estimation is that a 500-foot parkway provides space not only for a liberal traffic way, but for trunk sewers and possibly aqueducts and other public utilities. The necessity for these features of trunk line size may not have developed at the time that a 100-foot or 150-foot roadway is paved for its full width. In these times of heavy concrete pavement, it might mean either expensive tunneling or a new right-of-way to be acquired for a sewer or aqueduct, whereas the new parkway would have undisturbed ground for these purposes.

Traffic Control

An important advantage of the parkways both as to traffic carrying capacity and safety is the control established over abutting frontages both as to parking and vehicles entering or leaving the traffic stream. Prohibitory parking regulations are easily enforced because the absence of dwellings, business or other buildings immediately abutting the paved roadway eliminates the main motives for parking. The elimination also, of promiscuous entry, stoppage or departure anywhere and everywhere along both curbs reduces interference with steady flow to a minimum.

Urgency of Acquiring Rights-of-Way.—One of the special features of the policy of the Westchester County Park Commission is the acquisition of land many years in advance of the time when it is possible to incur the cost of development. The Commission has purchased land for its many projects from thirty to forty years in advance of its needs. While these projects are mainly in the nature of park developments, the same principle of early acquisition is sound in relation to the land required for highways. It is in this connection that it is here referred to. Many excellent plans for developing arterial highways and parkways have failed in realization because authorities have delayed too long in securing the land needed for the purpose. In many cases also, the cost of the improvements has been greatly increased owing to the same delay.

An illustration of the defects of delay in acquiring lands for streets is indicated by the facts relating to the beds of mapped streets referred to in Volume VII of the Regional Survey. The absence of adequate control over the areas proposed to be reserved for mapped streets, and of measures to prevent them being built upon, is perhaps the most deplorable feature in connection with the application of the official map of New York City.

Many of the proposals in the Graphic Regional Plan cannot be carried out, as already stated, in the immediate future because of the high cost of development. They can be carried out, however, to the extent of acquiring the land to be ultimately used for highways and parkways, and it is this part of the application of the Plan that is most urgent. As already pointed out, it may be possible in many cases to have the areas required reserved by agreement with the owners of property. In other cases it may be found to be impracticable to obtain land in the position suggested on the Regional Plan at reasonable cost, but by obtaining fore-knowledge of this fact it will be possible to change the alignment of proposed highways in order to fit in with the lines of least resistance in regard to the purchase of the necessary land.

On the whole it may be said that the importance of obtaining full control over the areas required to be reserved for highway communications is such that it would be better to defer some of the expenditures on development rather than miss opportunities to establish the plan of arterial roads by the necessary purchases of the areas best adapted and now available for that purpose.

Air Transportation System

In respect to air transportation only terminal facilities and approaches come within the scope of the Regional Plan. The Plan contains proposals regarding the most suitable sites for landing fields and airports. The principles on which these should be selected and the number and character of the sites proposed are dealt with

under the heading of Land Uses.[1] Landing fields and airports have to be so situated and so planned as to secure the safest approaches from the air as well as the most efficient services on the ground.

Perhaps the most important and difficult of all the problems that have to be considered in developing airports is that of acquiring either a site near to the center of

Photo by Fairchild Aerial Surveys, Inc.

LINDBERGH RECEPTION AT ROOSEVELT FIELD, LONG ISLAND

population or one which is accessible by quick transport facilities over railroads, transit lines or highways from the center. In the New York region it is practically impossible to obtain any large airport site so central that it would be in immediate touch with the main business activities and the largest groups of population. Therefore the selection of fields other than small landing places adjacent to water areas has to be made around the periphery of the city, and the problem of developing ade-

[1] See pages 366–375.

quate means of land communication to and from these outlying airports becomes of primary importance in connection with this form of transportation.

There must be an intimate relation of airport terminal to population density because the uses made of air transportation for passengers, the extent of which will make it economically feasible or otherwise, will depend largely upon the rapidity with which the largest number of people can reach their destination. Any saving in time that would make the airplane attractive as a means of carrying passengers, as well as special forms of freight, will be largely discounted if the distances of land transportation at terminals cause the passenger or article of freight serious delays in reaching their destination. Similarly, long delays in beginning the journey will militate against the usefulness and, therefore, attractiveness of the services.

Reference to the subject of air transportation has to be made here to indicate its logical connection with means of communication, but, as the proposals of the Plan are necessarily limited to those elements regarding aviation that come within the scope of Land Uses, they are more fully dealt with in the subsequent part of this report. As an instance of the connection between the airways and the question of Land Uses, there may be mentioned the importance which is attached in planning airports to the restriction of the heights of buildings and other structures on land adjacent to the air terminals. Thus zoning regulations have an important and direct connection with the problem of maintaining unobstructed airways as they approach landing fields. This feature in connection with the planning of airports is discussed and illustrated on pages 369 and 370.

CHANGING LAND USES. THE OLD AND THE NEW ON MURRAY HILL, MANHATTAN, AT 40TH STREET AND PARK AVENUE

Photo by Fairchild Aerial Surveys, Inc.

THE FACE OF NEW JERSEY TOWARD MANHATTAN

III. LAND USES

Introductory

Assumptions Underlying Proposals

The manner in which land is used and the functions and bulks of buildings upon the land are distributed and related, lies at the root of all urban problems. In the planning and development of land to serve these uses we meet the most vital issues in social and community welfare. Fundamentally, the soundness of systems of communication, the efficiency of industry and business and the healthy environment of residential areas are dependent on a well balanced arrangement of land uses. This arrangement cannot be obtained without the planning of land from the beginning—that is, before it is developed for building purposes—with the primary objective of securing the well-being of the community. In an existing urban region where large areas are already built upon, and where building growth has taken place in a haphazard manner, so far as uses and densities of buildings are concerned, nothing more can be done than to secure some amelioration of established evils. Fundamental planning which permits of adequate preventive measures is practicable only in the areas that are not yet developed.

In any approach to the study of land uses in a regional plan we have to remind ourselves of the following basic assumptions:

Improvement of Living Conditions

(a) As a primary requisite the plan must have in view the betterment of living conditions—so far as this can be promoted by improved environment of dwellings, by saving of waste in land development and by adequate facilities for transportation, outdoor recreation and other social needs.

(b) It is essential that schemes for improvement of housing conditions, in deteriorated and overcrowded areas, should be correlated with:

First—the erection of dwellings on comparatively cheap land in suburban areas, made accessible for this purpose and so planned as to secure economical types of development, open surroundings and adequate recreation facilities;

Second—general improvement schemes for deteriorated central areas, designed to open up more traffic ways and provide more adequate open spaces, thereby creating new values, giving benefit to the community as a whole and obtaining more space about the dwellings to be erected.[1]

(c) Living conditions are related to means of livelihood as well as to housing and recreation. Where the needs of business conflict with those of residence, a balance may have to be struck. For instance, some degree of concentration of dwellings may be a necessary concomitant to reasonable business concentration. On the other hand, underloading of the land with buildings as well as overloading may be injurious. Development in suburban areas that is too scattered to permit of making proper provision for health, safety and other public needs, is socially and economically unsound.

Adequacy of Space

As there is no shortage of land in the city or Region[2] there is no necessity for continuing to crowd dwellings on land to a degree that hampers free circulation and leaves insufficient space for sunlight, air and playgrounds for the inhabitants. Where this degree cannot be ascertained with precision, the plan should be made on the basis of what seems to have produced the most wholesome results in the past. There is no want of land to enable twenty-one million people to live in spacious surroundings within a radius of 25 miles of Manhattan.

Concentration of Business

The reasonable degree of concentration for business purposes that is desirable is that which will enable industry and business to function efficiently. The Region must offer facilities for doing business at a figure as low as that of competing regions, and the solution is transportation suited to topography and to the type of economic activity for which the Region is best suited.

Desirability of Better-balanced Growth

There is an increasing tendency in the Region towards creating more "friction of space" (i. e., a greater degree of separation measured in terms of time, cost, discomfort, fatigue) between homes and places of work, which is injurious to both living conditions and business.[3] Whatever may be said for or against what are called "centralization" and "decentralization," these terms should be avoided as they lead to confusion of thought. What is clearly desirable, in connection with the distribution of population and industry, is to have more even growth, a better balance between industry and residence so that people may live nearer to their places of employment, a wider distribution of building bulks, and more space about buildings for all purposes throughout the city and the Region. This may be promoted by encouraging the redistribution of functions or parts of industries, to the extent that is economically desirable, and by such measures as improved systems of transportation, more control of land development in the environs, greater stringency of zoning restrictions, and adequate measures to restrain the improper use of unhealthy or deteriorated structures in old sections of cities.

[1] See Regional Survey, Volume VI, Housing.

[2] See Regional Survey, Volume II, Population, Land Values, and Government.

[3] See Regional Survey, Volume I, Major Economic Factors in Metropolitan Growth and Arrangement.

High Buildings

High buildings are not to be condemned because of height in itself, but because of lack of proper relation and scale between height and the open areas (streets, squares and courts) surrounding buildings for the purpose of providing adequate room for traffic and transit and other necessities of transportation, as well as for light and air. In proportion as buildings are higher, the space surrounding them should be greater. For purposes of circulation, space requirements may be less in the case of a building whose use occasions the loading and unloading of merchandise, where facilities are provided for handling goods "off-the-street" (i. e., inside the lot line).

Standards of Open Space[1]

While there is no way of arriving at an exact standard of space needed for large pleasure parks, it is possible to take as objectives such practical achievements as are illustrated in the park systems of Westchester and Essex Counties. In the case of active recreation, the space required can be more accurately determined. This should be based upon a consideration of population densities, per capita space needs for different types of activities, probable amount of use, location and means of access.

Courtesy, Union County Park Commission

CHILDREN'S PLAYGROUND IN WARINANCO PARK, ELIZABETH, NEW JERSEY

The per capita requirements of open space increase with urban growth. Neighborhood parks and playgrounds should, in general, be located within residential districts just as are elementary schools. Large playfields and athletic fields may be less numerous and farther away from residential districts. Large parks and bathing beaches within the city limits should be so distributed that the people whom they are intended to serve can reach them quickly and cheaply. Regional parks may be more remote from large population centers, but reasonable means of access should be provided from these centers.

Maintenance of Certain Major Activities in Central Areas

The Port of New York, embracing the Manhattan, Brooklyn, Staten Island and New Jersey waterfronts, will continue to be the most important focus of regional growth. The lower half of Manhattan will remain the center for such activities as benefit greatly from a high degree of accessibility and from proximity to each other, including marketing, banking, and many kinds of fabricating.[2]

Brooklyn, Queens, The Bronx and Staten Island will expand as centers of industry and residence. The future development of the metropolitan area in New Jersey —including the great unreclaimed tracts of Hackensack and Newark meadows—should be regarded as of prime importance in connection with the prosperity and expansion of the whole Region, and particularly of the City of New York. It is

[1] See Regional Survey, Volume V, Public Recreation.

[2] See Regional Survey, Volume I.

mainly within this area that facilities incident to contact between long-distance rail and ocean traffic will have to be arranged. It is probable that the growth of heavy industries will continue to tend towards New Jersey.

Satellite and Neighborhood Communities

Better circumferential and cross-connecting rail transportation, improvements in the main highway system, as included in the proposals for improving the ways of communication, and developments in the distribution of electric power will all encourage the tendency of manufacturers to move away from crowded centers and promote more building use of areas in the environs. The restriction of immigration and the Americanization of the body of immigrant labor which is still centered in Manhattan will operate in the same direction. Large areas between and over a half mile distant from the existing radial lines of transportation but within easy reach of New York, are now open and largely unused. In certain of these areas opportunities will occur, as improvements take place, for the promotion of new communities with varied industries. One or more of these should be artificially promoted and intelligently planned in advance as models of development. The growth of genuine local communities should be stimulated by suggesting principles and patterns for the development of neighborhood districts in connection with new residential growth in the suburbs and the reconstruction of central areas.

These assumptions have been arrived at on the basis of studies made over a period of seven years. Every study has contributed evidence in their support. The distribution of uses shown on the Plan has been made with due regard to them, subject to the limits imposed by existing conditions, trends of growth and customary practices in achieving any ideal arrangement.

Relation of Land Uses to Prospective Population

The Regional Plan relates to the year 1965, the date which it is best to have in view in developing proposals for future growth. That year will be within the lifetime of a large proportion of those now living, and is far enough ahead to permit of imaginative treatment of problems.

As shown in Volume II of the Regional Survey it is anticipated, after careful study of past growth and existing trends, that the population of the Region in 1965 will be about twenty-one million people. Unforeseen circumstances and new forces may, as has been pointed out, promote or retard growth. Whether or not they may do so, it appears certain that they will cause changes to take place in the direction of growth and in the degrees and extent of urban concentration. It is anticipated, for instance, that the preparation of the Plan itself will have an influence upon the form, character and direction of growth, as well as in the lowering of densities, and thereby aid in securing a more balanced distribution and a higher quality of living and working conditions. Whether such a number as is stated is reached in 1965 or ten years later is not a matter of great moment. The important thing is that a plan should now be made to provide for the most healthy, convenient and efficient distribution of an additional ten or eleven million people within and surrounding the City of New York.

In both parts of the Plan, relating to ways of communication and land uses, respectively, the proposals deal in greater detail with the more central areas lying approximately within a 20-mile radius of New York City Hall, than with the areas beyond this radius. Within the 20-mile radius there are two zones, one an inner zone comprising the City of New York, Hudson County and the City of Newark and having an area of 365 square miles. Surrounding this central area an inner zone or belt of suburban land of 536 square miles extends to the 20-mile radius. Outside the 20-mile radius there are 4,627 square miles of territory for which less ample proposals are made than for the inner zones.

Broadly speaking, in considering land uses, the division of the Region has to be made on a functional rather than on a geographical basis. Within the 20-mile radius there are two definite classes of areas, one of which consists of land already more or less intensely built upon, and the other of partly developed suburban land with a high value for prospective building uses. Outside the 20-mile radius the building growth has taken place mostly in spots where comparatively small cities and villages have become established, and the greater part of the open land beyond the fringes of the small urban centers is still in primary use for agriculture or forest and has little or no building value.

As has been shown,[1] the extent to which communications and land uses overlap means that both have to be studied and planned together—although for the sake of clearness it is necessary to describe them separately. It is impossible to say whether new ways of communication will affect trends of growth to a greater or lesser degree than vice versa. It is obvious, however, that the adoption of a well-conceived plan for both will tend to promote a harmonious adjustment between them.

In the case of land uses even more than that of communications, any attempt to visualize the character of the needs of an increased population of eleven millions presents an almost superhuman task. However humbly it may be approached and however difficult it may be to obtain any reasonable degree of satisfaction from such partial accomplishment as may be realized, it is apparent that its doing is highly desirable and will prove of value. We have seen how enormous the expense will be both to make up present arrears and to meet future needs in railroads, transit lines and highways for such an increase of population as has been referred to. In connection with land uses it involves the building of over two million new houses, and of the industrial, commercial and community structures incidental to this residential growth. It involves also the provision of a greater percentage of open space for each hundred persons than at present, for as the population increases the ratio of open space to inhabitants in the urban areas should increase also, owing to the wider separation of the city and country. Only by the establishment of park areas within the city can the advantages of the open country be maintained in the central built-up areas.

[1] See page 143.

Questions to be Considered

Among the questions that have to be considered in presenting a diagrammatic plan showing existing and proposed land uses are:

First—How areas already built upon are likely to undergo change of use and density and what are the changes that it is desirable to promote;

Second—What are the directions likely to be followed by building expansion in new areas, and what directions are more desirable than others;

Third—What will be the probable character of growth in particular neighborhoods and how can this growth be encouraged to proceed along lines that will raise, and not lower, standards of living and working conditions?

The fundamental character of a plan dealing with land uses is only realized when it is perceived how small the accomplishments have been in promoting good development of cities, in those cases where plans have been limited to proposals regarding transportation and street systems. Many good street plans that have been carried out in cities have not resulted in lessening the evils of crowded building development on the land, because zoning plans have not been made and applied at the same time. It is of course equally true that zoning plans or regulations that control developments on private land are defective in proportion as they are unrelated to a transportation and street plan.

It is in respect to the uses of land in their widest sense—namely, the sense which has regard to the common social and economic purposes of industry, business (or commerce), residence and recreation, to the services of transportation, traffic and public utilities, and to the densities and heights as well as the uses of buildings—that most of the important problems arise in promoting or preserving a sound community structure. The basis of efficiency, and therefore of wealth, must be the health of the citizens in a community. The ways in which land is planned and used, the ways in which the functions and character of the buildings erected upon it are controlled, and the degrees of rational concentration and of spaciousness of building growth which are obtained in their proper place and relations, are all vital factors in promoting or retarding conditions necessary for health.

Regional Zoning

The purposes and methods of zoning are described in Volume VI of the Regional Survey. As ordinarily understood it is a method of imposing different legal qualities on land used for building purposes. Its local application has to be made through the administrative body authorized to prepare zoning plans under the state enabling acts.

In practice, zoning in the New York region has been carried out by cities, towns and villages either as part of a comprehensive plan or as a distinctive operation in

which is comprised nothing more than a zoning ordinance and a map illustrating the provisions of such ordinance. Zoning for use has dealt with the delimitation of areas for industrial, business and residential uses. Up to the present time it has not gone as far as to define and regulate other uses than those incidental to building. The question of its possible application for the purpose of preventing specific areas from being built upon, other than those that are definitely reserved as spaces about buildings, is a matter requiring serious consideration. This question will be discussed later in connection with the proposals for reserving open spaces, particularly those in the form of large country estates, golf courses and farms.[1]

In addition to the restrictions that are applied by zoning on the uses of land it prescribes the height to which buildings may be erected, the degree of occupancy of areas by buildings, and the setback of and amount of yard space about buildings, all of which have an influence on the bulk or density of private structures. Being a measure of control of private property, it is necessary that it should be carried out by correct legal procedure and by methods that cannot be questioned on the ground of being inaccurate, discriminatory or unreasonable. Hence zoning has to be applied to strictly administrative areas through the agency of the local governments who derive their powers from the state.

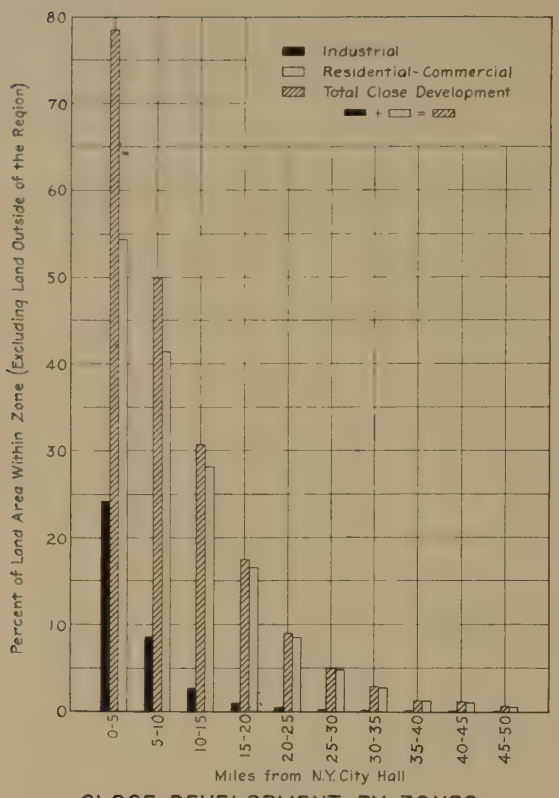
There is no way in which a scheme of zoning can be prepared suitable for definite application in a large region comprising many local government areas; and in such a region as that of New York which lies in three states, it is impossible to put forward uniform proposals suited to the different laws and procedure of these states. In a special degree, therefore, proposals for regional zoning in this region have to be nothing more than a broad picture of adaptabilities of land for building uses. It is evident that there is need of this picture for the purpose of affording guidance to the many municipalities as to the relationship between their areas and adjacent parts of the Region.

With regard to those proposals that relate to height, densities and bulks of buildings on the land, nothing can be shown on the Graphic Regional Plan. These matters are dealt with in the discussion of principles in Plan Volume II, supplementing the description of the practice and procedure which appears in Survey Volume VI.

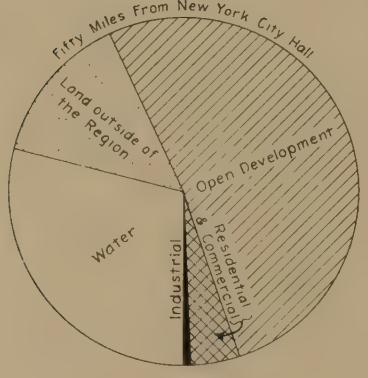
Apart from the impracticability of showing the districts for different uses in detail no object is to be gained by doing so. As Mr. Frederick Law Olmsted has pointed out,[2] regional zoning "should be confined mainly to the broad differentiation of a few large areas one from another, in such terms as will serve as a guide, or if put in legally binding form as a control, for subsequent detailed local zoning, in order to make the latter contribute as effectively as possible toward the well-balanced development of the region as a whole."

[1] See pages 380–383.

[2] Memorandum as to Regional Zoning, March 24, 1925.



CLOSE DEVELOPMENT BY ZONES



ALL USES

FIG. 22

DIAGRAM SHOWING LAND USES

Wedge-shaped "Zones" Desirable.—One important feature in the distribution of uses shown on the Plan is that it conforms to a system of wedges or corridors rather than circular bands. Where the word "zoning" connotes the fixing of a series of bands around a city within each of which one dominant use classification is made—for instance, a band predominantly residential or one predominantly industrial—it suggests both an unusual and undesirable pattern of growth. Urban growth usually spreads radially along the lines of transportation, and the intervening areas between these lines fill up slowly as additional means of transportation bring the radial strips or sectors nearer to each other.

There are cases, of course, where circumferential transportation routes create more or less continuous urban belts, but these are exceptional. But even if there were a tendency for urban expansion to extend out evenly in belts from the center, it would still be important to obtain radial rather than circular continuity for residential and industrial uses.

An instance of the need of obtaining wedge-shaped zones was given in Mr. Frederick Law Olmsted's preliminary report to the Regional Plan Committee on Long Island.[1] He pointed out that it was highly desirable that a wedge of land zoned for high-grade residence and having its natural amenities preserved should be maintained along the edges of the hills extending

[1] November 21, 1923.

from Forest Park in Queens to the Nassau County uplands. He showed that the continuity of this wedge was likely to be seriously broken by the development for industry of the Flushing marshes and an area between the marshes and Jamaica. This would result in an industrial area cutting transversely across a sector which for a considerable width was better suited for residence.

Take another example: As large areas in the Hackensack meadows are developed for industry, it will be desirable for some fairly wide corridor of high-grade residential development to be preserved from the edges of the meadows across the Passaic River into the hilly lands of New Jersey. But there is a danger of almost continuous industrial development taking place along both sides of the Passaic River between Newark and Paterson. If this happens it will create an industrial barrier across a desirable residential corridor which should extend across the Passaic River near Belleville.

As an imaginary example, picture the effect that an industrial circular belt spread across Westchester County from the Sound to the Hudson River would have on the residential growth along the parkways of the county. On the other hand, an industrial radial wedge penetrating into the county would not injure the residential wedges.

Existing conditions of both topography and transportation and the demands of public welfare show that broad differentiation of districts into zones should take place in wedges, subject to appropriate variation of uses in spots within such wedges and subject also to constructive schemes of zoning being made part of the development of belt lines, such as the proposed Metropolitan Loop shown on the Graphic Plan.

Availability of Undeveloped Land.—Before presenting the description of land uses it is desirable to draw attention to the large amount of land which is designated in the Plan for open development. This area—which represents about three-fourths of a region with 3,537,249 acres—is, in the minds of many people, more or less potential building land. It is inconceivable to the average person that any land in an urban region could be profitably reserved or set apart for anything but building uses. Yet the Atlas shows ample areas for all urban growth for a population of twice that now in the Region and only utilizes a fourth of the area for that purpose.

It is just as much a problem, in the Region, to find out how to prevent building where it is least desirable as it is to promote building where it is most desirable. It is a problem concerned with the profitable development of the building land as well as with the economic utilization of the open land. In it are included the questions of how large areas can be kept open that are needed for country estates and institutions and how the reservation of land for agriculture and afforestation may be made with benefit to the communities and the owners of land.[1]

[1] See pages 375–389.

The problem of the "friction of space" between homes and places of work also is related in a special degree to the problem of land utilization. A study of these connected problems reveals certain facts which point to recommendations and suggestions for the arrangement and distribution of these uses in the future.

Distinction Between Close and Open Development

It is found convenient to describe land uses under two broad headings: close development and open development. Close development is taken to mean land that has a considerable percentage of its area covered with buildings. No definite percentage figure was taken as guide for determining close development areas. The difficulty of obtaining definite information to enable an accurate estimate to be made would be too great, and, furthermore, such information would be of doubtful value because of the variety of degrees of density or closeness in different parts of the area. This variety is very considerable within different zones of the Region as well as between the central and outer zones. Within the central zone, comprising New York City, Hudson County and Newark, development is closer and the degree of openness less than in the suburban zone extending from the edge of the central zone to the 20-mile radius. At the same time there are considerable varieties within each zone as exemplified in the intensity of the apartment districts of The Bronx and the single family districts of Queens. The outer zone, comprising all the land beyond the 20-mile radius, differs in some respects from the character and use in the suburban zone, but it has practically the same intensities in its urban areas. Its most distinguished characteristic is the greater extent of its open areas. The extremity of variation is shown between Manhattan Island and Mountain Lakes. Open development in the former would be regarded as close development in the latter.

In general, close development indicates relatively intense use of land according to the prevailing standards of building concentration in different parts of the Region. In closely developed areas small city parks, playgrounds, highways and other open spaces which enter into the urban texture of a district, are assumed to partake of the character of intensity of adjacent land. They are therefore considered as being within the same classification as building land, that is, as part of a closely developed area.

In the study of uses the Regional Plan staff have obtained a large amount of information from the regional survey and from special studies in the field made by members of the staff during the summers of 1924–1927 inclusive. Valuable aid has been obtained from the study of airplane maps and views and of the property and topographical maps of different urban areas. For the purpose of the Regional Plan close development has been classified according to its use for business, industry and residence. The word "use" is intended to refer to the present quality of the land as building land rather than to the present extent of its actual occupation by buildings. Hence land that is subdivided or in transition from acreage to building uses is part

of a closely developed area. In the case of areas that are indicated as likely to be used for building purposes, the Plan, to a large extent, and in a broad way, forecasts that expansion of present intense uses which will be required to provide for the estimated population of the Region in 1965.

Open development areas include all land in the Region other than those comprised in close development areas. The sub-classifications of uses of "open" areas are:

(a) Public parks;
(b) Water supply reservations;
(c) Bridle paths and hiking trails;
(d) Semi-public open spaces, consisting of golf and country club grounds, properties in use by large institutions and cemeteries;
(e) Airplane landing fields, public and private;
(f) Open military reservations;
(g) Private estates and holdings which include extensive areas used for farming;
(h) Water areas as open spaces.

Probable Extent of Close Development for Residence

The proposed close residential areas are those which, by reason of their physical fitness, their proximity to the city or to local centers, and their existing or expected communication facilities, are the logical outlet for the pressure of population that is certain to come under normal circumstances. All the proposals regarding land uses are based upon the assumption that the transit, transportation and highway proposals will be realized to an effective degree.

No attempt has been made to evolve a formula establishing a mathematical relation between population increase and the amount of expansion of built-up areas in separate localities. It would be impossible to get reliable results from the application of such a formula to small units of area because of the uncertainties regarding directions of growth and of future extensions of transportation facilities. Without being applied to small areas it would be useless to attempt its application. For these reasons a different method of approach was taken.

It has been found that in general the provision of new facilities of communication has been followed by marked expansion of land development in their neighborhood. The effect of rapid transit on the distribution of population has been particularly striking. The areas suggested as adaptable for close development will be found to be those that will be made most accessible by extensions of and proposed additions to the existing systems of communication. Only a part of the areas shown as adaptable for building are expected to be built upon by 1965. It is necessary to show more than will be needed by that time, because it is impossible to predict the exact parts of the adaptable land that will be developed, because it is desirable to

encourage less intensity of building than has been the case in the areas already built upon and because much land in excess of what is needed will continue to be "improved" for building. In addition to the areas shown as likely to be used for building purposes, it is inevitable that many minor cross-road settlements will come into existence, and much development will occur that cannot be foreseen.

The detail street system on the base map upon which the Plan is printed is that appearing on the standard topographic maps published by the United States Geological Survey. On the average these represent conditions as they existed in about 1900. The area shown as completed block and street layouts can be taken roughly as slightly greater than the built-up area of that time. Comparing this with the area shown on the Plan as existing close development, it can readily be seen that although there have been large areas covered, nothing like twice the area for 1900 is built upon. The population of the Region in 1900 was approximately five and one-quarter millions, for 1925 it was roughly ten millions, or about double the figure for 1900. By comparing the areas of existing close development with the areas hatched for proposed close development it is seen that as much additional area is proposed for this development in 1965 as there was existing in 1925. The population estimate for 1965 is twenty-one millions, about double the 1925 figure. Therefore, sufficient land is suggested for the increase in population on the basis of a more scattered distribution than has heretofore obtained.

Effect of Physical Conditions

Within the closely developed areas already referred to as the inner zone the Graphic Plan shows peculiarities and irregularities in building intensities that have been brought about by physical conditions. Water areas, providing as they do valuable means of communication for certain purposes, have still the disadvantage of forming barriers to cross-communication between the lands abutting upon them. This is perhaps less so than would be necessary were as great ingenuity employed in improving short distance transportation facilities by water as by land. Those who travel by ferry find that the Hudson River adds from 15 to 20 minutes to the commuting time between Manhattan and New Jersey.[1] Staten Island, although a borough of New York City, has only 31 per cent of its area developed, largely because of its isolation from the rest of the city by water. The Hackensack meadows, the Newark meadows, and the islands of Jamaica Bay have proved, by reason of their physical characteristics, less capable of economic development than other land equally close, or nearer, to the metropolitan center. To some degree, also, the bluffs of the Palisades have impeded growth towards New Jersey areas, while the abrupt slopes of the Watchung Mountains have acted as barriers to communication and prevented more expansion of built-up areas in the westerly environs.

[1] See Regional Survey, Volume IV, page 80.

The effect of the attraction of the ocean and river waterfronts can readily be traced in residential as well as industrial location. In the central area industrial and commercial uses have taken up a large percentage of the waterfront and have had an influence in restricting residential and recreational uses of portions not required for industry and commerce. But in outlying areas residential uses have extended along the shores towards the periphery of the Region to a distance from the center considerably greater than corresponding development in the interior lands.

On the whole it appears that the difficulties presented by topographical conditions are outweighed by the advantages that are afforded, and that the greatest difficulties are due to defective planning rather than to the natural conditions in themselves. The waterfronts of the Region present exceptional opportunities for industrial development. Newark and Hackensack meadows, and the Jamaica Bay and Raritan districts provide enormous areas of land adaptable for industry. The low hills in the counties of Westchester, Bergen, Nassau, Queens and Richmond afford opportunities for a residential environment of high quality. The variety of recreation possibilities[1] and beauty of scenery offered by the uplands of the outlying waterfronts, by the Hudson River with its fringe of Palisades, by the accessible hills, valleys and streams in all parts of the environs, and by the not distant Watchung and Ramapo Mountains in the west, give the Region an exceptional richness in natural amenities.

Method of Presentation

On the Graphic Plan the various uses are delineated by color or symbol as defined in the Legend on page 25. The predominant existing uses in "close" development areas, other than small business or industrial areas, are shown in relatively solid color—while proposals for extension or change of these uses are shown in hatched lines of the same color. The different types of semi-public open spaces are distinguished by characteristic symbols.

Local business areas are indicated by red dots. No proposals are made for extension of these areas, which is a matter to be dealt with in city and village plans. Future business growth will take place in appropriate locations within the residential areas and may be regulated by local zoning plans.

The hatched areas give a more or less definite indication of the land that is adaptable for the various purposes but are not intended to show the precise extent and boundaries of land to be zoned for private use or acquired for public use. In these matters, as in all others, the Regional Plan is intended to be nothing more than a guide to local authorities for each municipal area in the preparation of definite city, park and zoning plans. These local plans when prepared will probably agree with the Regional Plan as to the adaptability of the land assigned to different uses—but will define the actual size and physical boundaries to be zoned or purchased.

[1] See Regional Survey, Volume V.

Close Development Areas

Industry

The delineation of existing and proposed industry to be found on the Graphic Plan is intended to be interpreted in mass relations instead of detail. Only the industry that occurs in sufficient quantity to be regarded as important regionally is shown as such, the remainder being absorbed by other use areas. The importance is relative rather than absolute. A small area, for example, may be shown in an outlying community, the population of which is largely dependent directly or indirectly upon the industry. A plant of the same size in Brooklyn or The Bronx, isolated from other industry, would be ignored. There is also an overlapping in the case of industry, as in the case of business, with other uses. The boundary lines were determined by field inspection instead of by formula demanding the application of detailed information. The commercial waterfronts and railroad yards of considerable area are included under the heading of industry.

A comparison of the areas designated on the Plan as existing or proposed industry (see Fig. 23), with the areas within the Region that are municipally zoned for industrial use (see Fig. 24), will reveal the fact that, for the communities which have a zoning plan, the areas shown on the Graphic Regional Plan lie almost entirely within the municipally zoned areas. This fact is significant in that it indicates the degree of harmony that obtains between the Regional Plan and local plans. There is a difference in the amount of detail in which the industrial areas are shown on the two sets of plans, the municipal plan being naturally in greater detail and more precise as to extent and boundaries of area. There are also some differences of definition. But in some cases the Regional Plan proposals differ from local plans because the regional survey has brought to light certain factors which show the need of changed locations.

Ample Areas for Industries.—It has been found in a special study of Port and Industrial Areas[1] that by 1965 about 200,000 linear feet of wharf will be required in addition to that existing in 1925, whereas it is possible to provide about 623,000 linear feet of wharf along the sixty miles of waterfront within the New York Port district that are available and well adaptable for port developments. Further, New York City and the New Jersey counties in the Region will require, by 1965, an estimated area of 14,400 acres for large-scale industrial development in addition to that existing in 1925. There are, in the Region, over 63,000 acres of land available and well adaptable for such industrial development. From these figures it is apparent that less than a quarter of the total area of land that could be used for industrial development may be expected to be put to that use. The areas shown constitute a liberal allowance for all probable development up to the year 1965, and indicate the areas most suitable for industries.

[1] Regional Survey, Volume IV, page 133.

From the points of view of distribution of population, of reducing the "friction of space" within the metropolitan district, and of best serving the needs of industry, it is considered desirable to provide residential areas as near as practicable to the places where the people are employed. This is desirable in the interests of industrial efficiency as well as to enable the cost of transportation to be reduced to a minimum. Some of the worst evils in the modern city are due to the wide separation of areas serving different but closely related functions, and among other things that are needed

Photo by Fairchild Aerial Surveys, Inc.

SOME FEATURES OF THE DEVELOPMENT SUGGESTED FOR THE HACKENSACK MEADOWS

The area above the dashed line is reserved for residence and subsidiary uses. Below the dashed line the area of the meadows is assigned to industry except for two large park areas and the proposed straightened river channel.

to secure more balanced development is the bringing of the homes of the factory workers nearer or at least more accessible to the factories. For these reasons a large portion of the Hackensack meadows and considerable areas surrounding Jamaica Bay are reserved for residential purposes. Another consideration in proposing parts of the Hackensack meadows for residence is the fact that, since the prevailing wind direction is approximately from the northwest, Manhattan and the New Jersey shore opposite Manhattan will be troubled less with smoke nuisance if the northerly half of the meadows is put to residential use. The question of supply and demand of land for

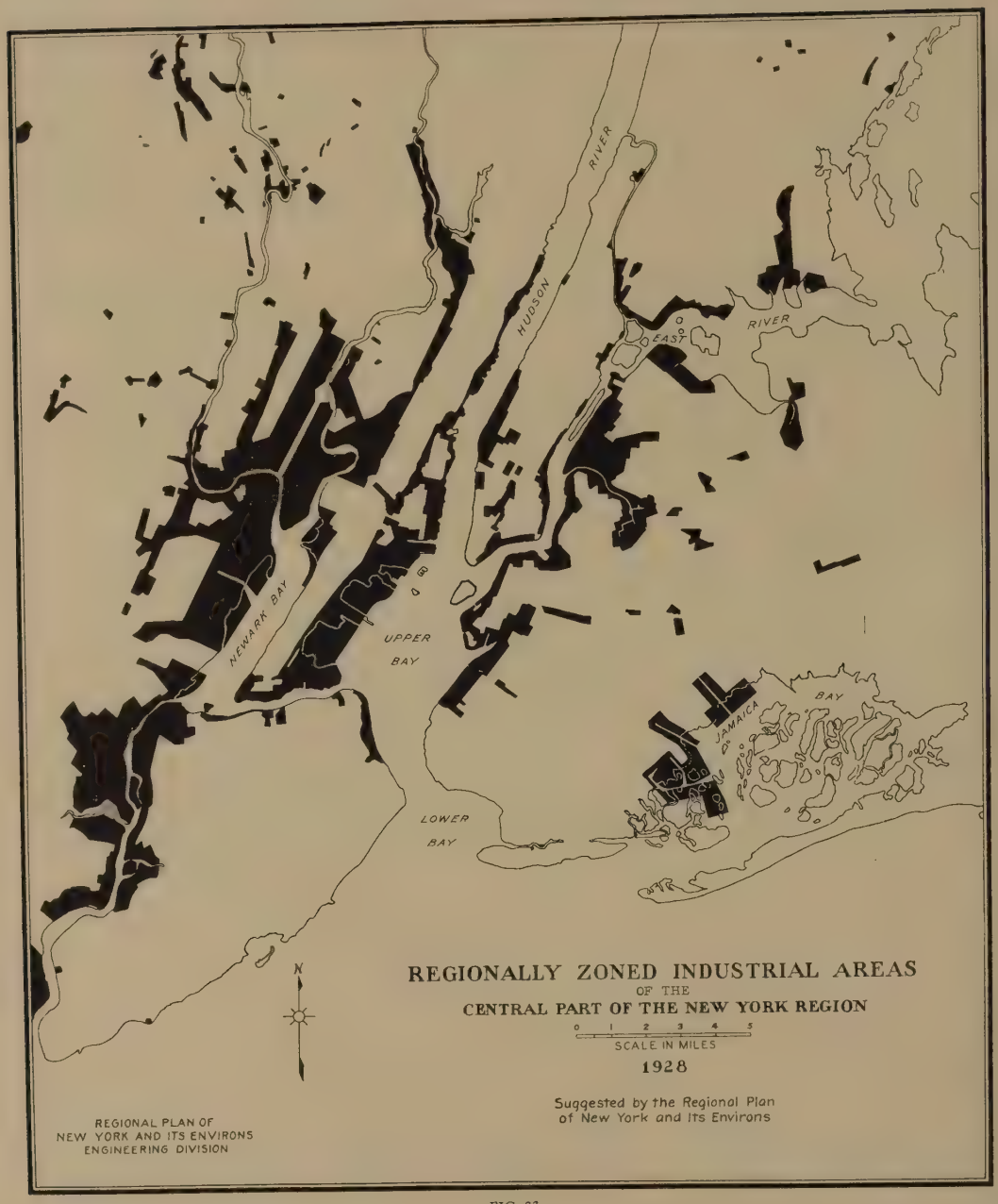

HUDSON RIVER
EAST RIVER
NEWARK BAY
UPPER BAY
LOWER BAY
JAMAICA BAY
N
REGIONALLY ZONED INDUSTRIAL AREAS
OF THE
CENTRAL PART OF THE NEW YORK REGION
0 1 2 3 4 5
SCALE IN MILES
1928
Suggested by the Regional Plan
of New York and its Environs
REGIONAL PLAN OF
NEW YORK AND ITS ENVIRONS
ENGINEERING DIVISION

FIG. 23

HUDSON RIVER
EAST RIVER
LONG ISLAND SOUND
NEWARK BAY
UPPER BAY
LOWER BAY
JAMAICA BAY
MUNICIPALLY ZONED INDUSTRIAL AREAS
OF THE
CENTRAL PART OF THE NEW YORK REGION
0 1 2 3 4 5
SCALE IN MILES
1928
LEGEND
Heavy Industry
Light Industry
Undetermined or Unzoned
Industry Excluded
Compiled from local zoning maps and ordinances
REGIONAL PLAN OF
NEW YORK AND ITS ENVIRONS
ENGINEERING DIVISION

FIG. 24

industries likely to be attracted also entered into the considerations on which the proposals are based.

The physical features that have been considered to be of primary importance in selecting sites for industrial location are the waterfronts, the railroads, the topography and the distance from the metropolitan center. It will be noticed that the existing industrial areas are to a large extent adjacent to the waterfront where level land is available. In many places shallow water has been filled in to form land for such use. Most of the land used for large-scale industry is relatively level, and has a low altitude. Such land is fortunately less desirable for other uses, except perhaps certain forms of recreation, and for that reason lends itself to a kind of natural zoning.

The industrial lands of the interior appear related to railroad facilities, either main lines or spur tracks. Practically all of the existing industrial areas have an obvious relation to business areas and to population. Distance from lower Manhattan appears to be an important factor.[1]

The proposed industrial areas, hatched in purple on the Graphic Plan, include proposals for the expansion of existing areas together with the development of entirely new areas in accordance with the principles that have been referred to, such as convenience of location in relation to combined railroad and water transportation.

Factors Influencing Industrial Location.—Perhaps one of the most important functions of the Regional Plan is to bring out the following factors in connection with the future development of industry in the Region:

(a) Although the definite location of industrial areas will have to be determined by the different administrative authorities, they are of such a physical character, and so related to the systems of transportation that they should be developed in accordance with a regional plan. The present plan of the Region provides an ample basis on which to proceed to make further studies and more definite plans. It will be seen that the areas which are most adaptable for heavy industry require more or less extensive reclamation. Naturally the sites which have been taken up in the past by industry are those which have involved least cost for preparing the land and the time has only now come when the further extension of industrial use along the waterfronts involves expensive reclamation projects. No land is so adaptable as the level areas which only need to be reclaimed to provide, in the first place, more waterway communications to the land and, in the second place, large areas of level land having a variety of transportation facilities. It will be noted that these industrial areas are of large extent in both states.

(b) Municipal authorities cannot or are unlikely to undertake the expense of carrying out the extensive reclamations that are necessary to meet the needs of industry without national and state assistance. Thus assistance must be obtained to carry out the comprehensive schemes that are needed. In the case of Jamaica Bay, national

[1] See Fig. 22, page 316.

co-operation has already been obtained by the City of New York. Important improvements have been carried out by the City of Newark in the development of its port and of an airplane landing field on the Newark meadows. Such projects, however, are only beginnings of vast schemes of reclamation likely to be carried out in the future in Long Island, The Bronx and Staten Island; on extensive areas adjoining the Upper Bay in Bayonne and Jersey City; and on the meadow lands in Newark, along the lower Hackensack River and at the mouth of the Raritan River.

(c) Either the Port of New York Authority or a similar body, representing both the States of New York and New Jersey and able to bring about close co-operation

Courtesy, Bush Terminal Company

BUSH TERMINAL

An industrial development on the Brooklyn waterfront. The terminal has an area of 200 acres.

between public authorities and transportation interests in the Region, needs to be given power to promote the development of a plan for the location of future heavy industries and the reclamation of areas for that purpose. The whole Port depends for its future growth and prosperity on the proper utilization of the enormous asset which New York City and certain New Jersey counties possess in these large areas of marsh and water which are capable of reclamation.

(d) It is probable that the tendencies towards industrial dispersal will increase in future and lead to the extension of some of those nuclei of industry that already exist in the environs, as well as the formation of new industrial communities in areas where accessibility will be improved as a result of developments in communications. A first consideration in selecting sites for new satellite communities, like that being created at Radburn, New Jersey, is that more attractive industrial opportunities

than now exist may be provided. It seems inevitable that those seeking sites for manufacturing plants, whether they be newcomers to the Region, or emigrants from the existing crowded centers in the Region, will go where the best opportunities are offered. For instance, the assembly in certain areas of large parcels of land in one ownership and served by power and transportation facilities, in the manner now done in the Niagara District by those interested in promoting the supply of hydroelectric power, would be one method of attracting industry to a locality. In the future the organization of manufacturing sites will be carried out as part of schemes which have for their object the establishment of entirely new industrial communities in strategic situations, where all residential, business, cultural and other social needs will be provided. Proposals are included in Plan Volume II for the development and location of such organized satellite communities.

(e) If and when industrial location is organized on less haphazard lines than now prevail, it may be hoped that public opinion—and political leaders—will be prepared to accept the situation that the choice of industrial sites should not be influenced by other than economic considerations. Rivalry between different political units—such as between New York City and the New Jersey metropolitan counties—is good and in the interests of both if it is expressed in the form of making economically sound improvement of their facilities for industrial settlement. When, however, prejudice in favor of one unit against the other results in money being spent on extravagant competitive schemes, it is bad and against mutual interests. The whole Region should be considered as a unit in connection with the distribution of industries, if each political unit within it is to enjoy the fullest benefit from their further growth.

Specific Proposals.—The most important proposals for industrial development are located as described below:

(1) *Along the Proposed Railroad Outer Belt Line.*—It is expected that the construction of this belt line will open up considerable areas, at present undeveloped, which will be highly attractive to manufacturers, particularly in view of the highway and suburban rapid transit facilities that are also proposed. The areas shown on the Plan represent an attempt to secure a desirable balance between the industrial, residential and recreational lands along the belt line.

(2) *The Raritan River and the Proposed New Jersey Ship Canal.*—In the light of the suggested straightening of the Raritan River below New Brunswick, the construction of the proposed New Jersey Ship Canal between Raritan Bay and the Delaware River, and the nearness of the areas affected to the proposed railroad outer belt line, considerable industrial activity is expected in this district. A large portion of the land shown as used for industry is being excavated for clay; there is reason to expect this use to continue for some time.

(3) *The Arthur Kill.*—Along the shores of the Arthur Kill both in New Jersey and in Staten Island are large areas the logical use of which appears to be industrial. Although there is considerable land in Staten Island to the east of the areas proposed for industry that is also adaptable for such use, a number of reasons suggest other uses. First of all, there is more than enough suitable land for industry in the locality. There is need, moreover, for the more inland areas to be reserved for low-cost housing for the workers in the factories that will occupy the waterfront in the near future. Finally, in view of the prevalence of wind

direction being from the northwest, too great a bulk of industrial occupation would tend to blight a large portion of attractive residential and recreational possibilities of the central part of Staten Island.

(4) *Newark Bay.*—With the exception of some areas suggested for open spaces it is proposed that the western shores of Newark Bay together with large expanses of low-lying hinterland be developed for port and industrial uses.

(5) *Hackensack Meadows.*—As much of the meadows has been proposed for industrial occupancy as was thought desirable after a comprehensive survey for this district.[1]

(6) *Upper Bay, adjoining Bayonne and Jersey City.*—Reclamation of the shallow waters of the westerly part of the Upper Bay will afford space for a new harbor development along the Bayonne and southeastern Jersey City waterfronts. The relative amounts of land devoted to industry, residence and recreation is explained by the fact that the type of industrial activity expected will need large operating space with relatively few workers. Jersey City, the western part of Bayonne and the northern part of Staten Island will furnish the additional housing facilities needed for the workers.

(7) *The East River, adjoining The Bronx.*—The stretch of shore between the Harlem River and the Bronx River is proposed for industrial use.

(8) *Westchester Creek.*—Proposed railroad and highway facilities in combination with the waterway afforded by the creek make this district peculiarly favorable to industry.

(9) *Newtown Creek.*—An extension of present industrial uses of land adjoining this creek would be appropriate.

(10) *Long Island City.*—Certain types of industry will continue to be attracted to this locality.

(11) *Astoria.*—It is proposed to extend the industrial area along the East River as far as Flushing Bay.

(12) *Flushing Meadows.*—The lower portion of the meadows, now in process of being filled in, is proposed for industry. The upper meadows and an area suggested for reclamation at the head of Flushing Bay are suggested for recreation.

(13) *Jamaica Bay.*—A survey of existing port facilities of the New York region, including estimates of future expansion, points to the conclusion that only a part of the industrial and port possibilities of Jamaica Bay will be needed by 1965. On the Graphic Plan the westerly shore is shown largely for industrial development; the remainder of the shore is reserved for residential and recreational uses. Plans for piers and channels adopted by New York City have been shown in outline. It is suggested that provision be made in the center of the bay for a recreational area of regional importance; also, that space be saved in the eastern part for an airport.

(14) *Miscellaneous Proposals.*—A number of important improvements are needed in connection with the development of the Port, that cannot be shown at the scale of the Plan. For example, more large piers are needed on the Hudson River; the land approaches to the Staten Island piers require to be improved; the extension of Brooklyn piers is desirable; and a quay development is needed along the East River waterfront in Manhattan. These, together with certain other proposals, especially several of those of the Port of New York Authority, are of urgent importance for treatment in city plans.

Business

The business areas indicated in the Atlas comprise the principal business districts of communities having a population of over 25,000. Symbols are used to indicate the approximate location of the business districts of those which have a population between

[1] See Regional Survey, Volume IV, pages 150–157.

3,000 and 25,000. Both of these districts may be considered as having regional importance. As already pointed out, the small local centers of business are so numerous and cover such minute areas that they are not appropriate for inclusion in a regional plan. They are regarded as incidental to, and part of, the areas designated for residence.

Only one new business center is proposed. This is near the center of the Hackensack meadows, and is suggested in the light of a detailed study and a comprehensive plan for proposed development of the meadows.[1] In most parts of the Region having close development, nuclei of business have been established and the expansion of these will provide for a large part of the needs of the further residential growth. It was not considered practical to attempt to forecast the amount or direction of expansion of these small existing centers. Business growth, being incidental to residential growth, must be controlled by local planning and zoning after the pattern of residential growth is determined.

Plan Volume II will contain a statement of principles with regard to the expansion of existing and the choice of new business areas. It is well to repeat here, however, what is said in the description of highways[2] as to the necessity of limiting the business areas along the frontages of highways to those places where there are cross communications or large residential areas in the immediate neighborhood.

For the broad purposes of regional planning it has been thought to be sufficient to outline the principal business areas from general field inspection. The scattered nature of most of these areas makes it impossible to show their boundaries on the scale of the Regional Plan. Although a few definite business areas are indicated on the Atlas, this is not to be interpreted as implying that there is no considerable business in the areas outside such boundaries, or that within the boundaries there are no other uses. The Atlas shows the areas that are predominantly of a business character and not the precise limits or extent of business use in these areas.

It will be noticed on the Atlas that business areas tend to appear centrally located with reference to the limits of population. Where the population unit is on the shore of a large body of water the business area appears inland from the shore, partly because of its tendency to seek the center of gravity of population, and partly because of pressure of industrial waterfront uses. The size of the areas varies roughly with the population served. Business tends to gravitate toward relatively level land, where it is available, but not ordinarily the land with the lowest altitude. In general, business may be regarded as the form of urban use of land that is least subject to change. There are strong trends of change in the central business districts, however, which are discussed at some length in one of the survey volumes.[3]

Decentralization of Business.—One of the reasons why definite business areas, other than those already well established, are not shown on the Graphic Plan, is that

[1] See Regional Survey, Volume IV, page 150.

[2] See page 299.

[3] See Regional Survey, Volume I, pages 100–104.

tendencies towards change in distribution of business are so pronounced as to make it impossible to give any approximately accurate forecast as to what is going to happen even in the next few years. Tendencies towards decentralization of business are shown in the rapid extension of small units of suburban chain stores and the successful development of numerous trading centers in the environs serving very wide areas of territory. Some village shopping areas that only a few years ago supplied the needs of small local communities have increased their facilities several hundred per cent and now serve residential districts which extend to a radius of several miles.

The modern store must be easily accessible by automobile and provide ample facilities for parking. The erection of large department stores at strategic points along the transit corridors within the 15-mile radius presents a prospect of profit to some large traders which cannot be ignored much longer. Indeed schemes are now on foot to build department stores in a few places having a high degree of accessibility and yet in comparatively open areas. It is interesting that the choice of locations for such stores that have been indicated are not in the centers of the suburban cities, but in open districts near them where ample space can be obtained for circulation and parking of cars. The new trends in retail business itself, and in domestic marketing, coupled with the whole process of industrial and residential expansion, mean that the Region is passing through a period of active transition which is likely to continue for some time before any stable condition is reached.

In this connection, as well as in connection with industrial distribution, the establishment of new satellite communities will afford special opportunities for creating important business centers, to serve not only themselves but large areas of tributary territory. The new town of Radburn, New Jersey, will provide such a business center, and in proportion as this center supplies more than local needs its establishment will have the same effect on population increase as the establishment of industries in that community.

Residence

While it is impossible, because of the complexity of conditions and trends, to arrive at any precise ratio of land that is likely to be used for industry, business and residence, it is safe to say, on the basis of such studies as have been made, that not less than 75 per cent of an urban area will be required for residence purposes. In central areas which are closely built-up with apartment houses and tenements, the land needed for residence, in comparison with the land needed for industry and business, is necessarily smaller than in more open areas in the environs. It would lead to false conclusions if calculations were to be made on the basis of either the more crowded central areas or of more open suburban areas. Such a large proportion of the people live in one district and work in another that it is only by taking an extensive area that any reasonable estimate of the proportions likely to be used for different purposes can be made.

If to the actual sites of the residential buildings there is added the space required for local parks and playgrounds, it is certain that the proportion of 75 per cent is an underestimate. On the other hand, it has to be remembered that, as a rule, more land is left open in connection with industrial uses in suburban areas than with residential uses. Therefore, the estimate of three-fourths for residence is believed to be a fair and proper one on the average for a large area. It is necessary that this estimate be borne in mind in connection with the construction of all ways of communication because it is apparent that these ways, particularly transit lines and highways, should be adapted to the best economic use of land.

A DESIRABLE TYPE OF CLOSE DEVELOPMENT FOR SUBURBAN LOCALITIES
Architecture, planting and location of the house in relation to street and adjacent houses, contribute to the quality and general character.

Conceding that three-fourths of the land may be required for residence, it is obvious that a sound plan should visualize the services needed, and how they can best be provided, for this predominant use. A serious economic situation has arisen in those areas in which an excessive amount of frontage has been assessed or zoned for business use in advance of residential development. It is only in proportion as land can be profitably utilized for business in the immediate future that it should be assessed or zoned for that use. It cannot be too often emphasized that the parkway type of road gives direct encouragement to residential growth—the more prevailing use—and in time gives stability to the establishment of business areas in those strategic situations where they can be made a financial success.[1]

Friction of Space.—The areas designated for residence on the Plan include all built-up areas not zoned for industry or business. The most striking feature in the

[1] See pages 298–300.

growth of the New York region in the past 20 years, as has been emphasized in the regional survey, is the extent of separation and the increasing tendency towards wider separation, between the places of residence and the places of work. In Survey Volume IV an estimate is given that on a typical business day in 1924 about 2,868,700 people entered that portion of Manhattan south of 59th Street. An indication of where these people came from is shown by these percentages: 48.5 per cent entered from north of 59th Street; 39.1 per cent from Brooklyn and Queens; 11 per cent from New Jersey; and 1.4 per cent from Staten Island. The demand which is being made for new ways of communication to meet the needs of this vast commuting population represents one serious problem, and another is the planning of the areas in the suburbs to which new migration is taking place.

It seems inevitable that Manhattan will maintain a predominance as an occupational center. There is little likelihood therefore that there will be any diminution of the numbers who will move to and from the Island daily, no matter what may be the extent of movements in the direction of decentralization. While, however, the numbers of persons seeking a livelihood will continue to crowd the transit lines at the peak hours of each day, it is doubtful if the numbers of those who merely come to Manhattan for shopping or pleasure will continue to increase, or even to hold to their present volume, in face of the growing discomfort of traveling. Sub-centers are growing up, where most social and domestic needs are supplied nearer to the places of residence. Reference to this fact has been made under the heading of "Business."

Influences on Location.—In considering the places adaptable for close residence such questions as proximity to sub-centers; the character of local attractions such as seashore or river front, parks and parkways; the time, cost and attractiveness of the means of travel; and the general amenities of location including the social element of fashion have to be taken into account. Field inspection of the Region revealed in general a distribution varying in type with distance from the metropolitan center and also from sub-centers. Until recently the residential hotel, the apartment, the row house, the semi-detached house, the single family house and the smaller estates constituted a pattern of types which prevailed in order of distance from the main business centers. In recent years, however, considerable variation has taken place in this arrangement, particularly in the form of the penetration of the apartment house into outlying districts such as along the Bronx River Parkway in Westchester County.

There are certain types of residential occupancy of land which may be described as having characteristics of the unusual or picturesque. These are found in districts where there are good facilities for recreation, for summer vacation, and for social activity. Along the ocean beaches, river banks and lake shores are to be found cottage developments that are used as dwellings during the summer months. As these developments increase in size they tend to become permanent. Such is the case with Far Rockaway, Asbury Park and Atlantic Highlands. Sometimes a golf club, a

yacht club or some other sport club is the deciding factor in attracting residence and in determining the character and grouping of the buildings. Exclusiveness desired by a social set is responsible for some developments, an outstanding example of which is the Tuxedo colony.

Fashion appears to operate in the equation of residential desirability in very much the same way that it works in connection with the clothes people wear.[1] Recent developments in Manhattan along the East River front have been influenced by "social" considerations, but in this, and other cases, a number of other reasons enter into the making of a district more or less desirable for residence. Among the influences are those connected with the diverse mixture of races in the New York region. An invasion by one racial group of the settlement of another forces the latter, if its people consider the newcomers to be undesirable neighbors, to seek a new district.

RECENTLY CONSTRUCTED APARTMENTS ALONG THE BRONX RIVER PARKWAY

Residential use adjusts itself to considerable variety of topography and altitude. For obvious reasons it avoids marsh lands. With other factors equal, high-cost development tends to seek relatively high and comparatively uneven land. The places most favorable for high-cost development appear to be along waterfronts on considerably elevated land, such as Riverside Drive, Manhattan, and the Heights in Brooklyn, in the central areas. Sites overlooking parks and along parkways are also favored. It will be noted that, as a rule, the poorest and least orderly developments are to be found on relatively low and level land.[2]

Street System.—It was found to be impracticable to bring the street system up to date, and no effort was made to show a proposed extension of existing streets that would be needed for the expansion of close residence. The layout of such streets is a function of city and village planning and it is not desirable to include such detail in a regional plan.[3] There is opportunity in planning and developing a system of minor

[1] See Regional Survey, Volume IB—"Clothing and Textile Industries," page 18.

[2] For a report on Housing, see Regional Survey, Volume VI.

[3] For discussion of planning and development of land, see Survey Volume VII.

residential streets for securing great economy and beauty of arrangement by means of a closer co-ordination of street plan with topography than has heretofore obtained in the Region. In the design of regional highways consideration was given to the relation of main highways to areas adaptable for the formation of neighborhood units.[1]

Major Proposals for Extension of Residence.—The extensive areas that appear on the Graphic Plan as proposed for residence, are located as indicated in the following paragraphs. They should include provision for purely local parks, which are not shown on the Plan.

(1) *Staten Island.*—Partly due to its isolation from the remainder of the city and also from New Jersey, nearly 70 per cent of the land area of Staten Island is undeveloped. The provision of circulation facilities will make accessible about 25,240 acres of land for residential and recreational uses.

(2) *Queens.*—Fifty-six per cent, or 38,590 acres, of the area of the borough of Queens is undeveloped.[2] Of this, a relatively small amount will be used for industry and business, and most of it will be occupied with residential development following rapid transit construction.

(3) *The Bronx.*—There are about 10,000 acres of undeveloped land in The Bronx, most of which will be residential in character.

(4) *Brooklyn.*—There are over 9,000 acres of undeveloped land[2] in Brooklyn. While most of this has been proposed for extensions of residential areas, considerable portions have been set aside for industry.

(5) *Hackensack Meadows.*—The upper portion of the meadows is proposed for residential and supplementary uses. Roughly 15,000 acres is suggested for residence, the major function of which should be to provide homes for the industrial workers who will be needed in the industrial development of the lower portion of the meadows.

(6) *Middlesex County.*—The provision of suburban rapid transit, the construction of the outer belt line railroad, and the industrial expansion expected in the Raritan Port district constitute the basis for suggesting large residential close development in this county at South Amboy, Perth Amboy, Woodbridge, South Plainfield and along the Pennsylvania Railroad between Rahway and Metuchen.

(7) *Union County.*—Practically all of this county east of the Watchung Mountains is expected to fill up with residential occupancy except for the industrial areas along the outer belt line and along the Arthur Kill and Newark Bay.

(8) *Essex County.*—Practically all of the undeveloped lands of this county east of the Watchung Mountains will fill up with residential occupancy except the easterly part of the Newark meadows, part of which is suggested for industrial use.

(9) *Passaic County.*—Residential close development is suggested for most of the undeveloped land south of Paterson in the county.

(10) *Bergen County.*—The provision of highway, transit and transportation connections with Manhattan is expected to make large areas of this county favorable for close development. The expanse of land east of the upper Hackensack River as far as the Oradell Reservoir and extending to the Palisades is suggested for such occupancy. There are also considerable areas east of Paterson and surrounding Ridgewood suggested for possible close development; the new community of Radburn is included in the former.

(11) *Westchester County.*—Most of the undeveloped land south of a line connecting Dobbs Ferry, White Plains and Port Chester is expected to be occupied with relatively close development,

[1] See Regional Survey, Volume VII.

[2] Not counting the islands of Jamaica Bay.

dominantly residential. The triangular area between Tarrytown, White Plains and Dobbs Ferry is likely to be occupied with a high-cost open type of residence.

(12) *Nassau County.*—The central and southerly portions of the county are suggested for close residence interspersed with recreational areas. Except for the normal expansion of existing communities the northerly portion is suggested for an open type of residence.

Open Development Areas

Public Parks

Public parks are open areas that have been secured by purchase or otherwise, and dedicated to public use by some government agency for the purpose of recreation. In the New York region the political unit of government is a state, a county, a city, a borough, a town or a village. On the Atlas the parks greater than ten acres in extent are shown in color. The positions of small, isolated parks having an area between one and ten acres are indicated by a symbol. Parks, playgrounds and public squares smaller than one acre are omitted. There is no indication on the map as to the extent of development or the intensity of use of the various parks.

Parks include the parkways that have been already described in their relation to highways as part of the ways of communication. Parkways are strictly roads through parks, and, as frequently described and legally interpreted, they are indistinguishable from the park areas which they intersect. The owner of land adjoining a park has, as such, no right of entrance directly from his land to the park. So he can be denied a driveway connection with a parkway. The latter are here referred to as being essentially parts of the park system and as having important features of recreational value. These features include the opportunities they give for driving through beautiful natural scenery, unspoiled by ugly artificial structures, and for rest, picnicking and play in the open.

Although a park which is, or more strictly speaking contains, a parkway is less restful than a park which has no traffic lane running through it, the fact that it can be driven through by enormous numbers of people makes it a most valuable feature in the park system. It may also have value as a connecting link between large country parks or as a pleasing means of approach from populous centers to such parks. The provision made in parkways for riding and walking is a contribution of high value to recreation, as well as a facility for improving means of communication. Parks that include, or are commonly known as, parkways usually vary greatly in width and character—sometimes approaching to the narrowness of highways or boulevards and sometimes widening out into large forest areas like Saxon Woods in Westchester which adjoins the Hutchinson River Parkway and is as large as Central Park. Different kinds of landscape design are employed in laying out these longitudinal parks, but as a rule they are characterized by informal or naturalistic treatment. Care is usually taken to both preserve and enhance the natural landscape features.

Boulevards, as previously defined, are, from administrative and legal points of view, highways—but they are highways of such a type that in a subordinate sense, they form part of the system of parks as well as of communication. As was pointed out in the description of parkways and boulevards, they should both be recognized as important elements in the regional park system. The following description of parks would be incomplete unless parkways and boulevards were also included as being important supplementary park features. On the Graphic Plan the ways of communication classified as parkways or boulevards are shown by a green and red

Courtesy, New York Zoological Society

A VIEW IN BRONX PARK, NEW YORK CITY

symbol—the green denoting their relationship to the park system and the red to denote their function as highways. Thus their dual relation is clearly indicated.

Raritan and Passaic River Parkways.[1]—Although the parkway routes have been described as part of the highway system, it is desirable to include here a more detailed discussion of two of the proposed rivershore parkways—the Raritan River Parkway and the Passaic River Parkway. In addition to presenting a number of similar physical problems in common they are also alike in that there is urgent need for immediate public control of the two rivers and for public ownership of their banks.

[1]See description of boulevard and parkway routes Nos. 3 and 9 (pages 275 and 276, respectively).

The portion of the Raritan River between Bound Brook and a point two miles below New Brunswick is suggested as a parkway. Between these municipalities there is a roadway on each side of the river. The old Delaware & Raritan Canal follows along the river between the southerly roadway and the stream. An ideal parkway could be created by the acquisition of the land between the roadways. The first step in the development of the parkway would be to purify the waters of the river by treatment of the sewage that now flows into it. A recent chemical and biological survey by a department of Rutgers University found that "it is dangerous to swim in

Courtesy, Westchester County Park Commission

HUTCHINSON RIVER PARKWAY, WESTCHESTER COUNTY

The view is looking north toward a bridge by which East Third Street, Mount Vernon, is carried over the parkway.

the Raritan River anywhere from the town of Raritan to Perth Amboy." The purification of its waters will restore the river to its former popularity as a stream for swimming, fishing and boating.

An ultimate development would probably include a parkway road entirely within the park, winding about on the northerly strip of land between the river and the present road. At some places the strip of land is quite wide, embracing considerable areas. These areas could be developed as parks or, if the land is found too expensive to be acquired, could be left in private ownership along the present road.

This parkway as a whole would possess a character that cannot readily be obtained in any other part of the Region. The charm of repose appears to be the secret

of the river's attraction; the broad yet intimate expanse of the stream, the calm mirror-like surface of the canal, the peaceful rounded forms of vegetation that cling to the low banks, combine to form a series of pictures that should be preserved for the enjoyment of the people.

The Passaic River valley presents a problem, as was noted above, similar to that of the Raritan. The portion of the Passaic between Paterson and Newark corresponds to the portion of the Raritan between Bound Brook and New Brunswick. For the greater part of the way there are roads on both sides of the river. The Passaic, however, has experienced a more intense use of its shores for industry and residence and a more disagreeable use of its waters for sewage disposal. Steps have already been taken to purify the waters by building an intercepting sewer,[1] the outfall of which was put in operation in August, 1924. After two years a decided change for the better was noticed.

Only a very small strip along the banks of the Passaic between Paterson and Newark is still available for park acquisition. This land should be acquired at the earliest possible time. It is still feasible to save the general landscape character of the stream for the greater part of the way. The river is comparatively narrow in width and safe for boating. It has the scale and quality of the pleasant reaches of the Thames and Seine for that intensive pleasure use which is made of parts of these rivers.

A report by Mr. Cornelius C. Vermeule for the reclamation of 46,500 acres in the Passaic valley was in the hands of the Governor of New Jersey in December, 1928, for transmission to the legislature. By means of flood gates, dams, lakes, new channels and deepened existing channels this study proposes to regulate the flow of the river in such a way that a large body of land, now marshy and subject to overflow, will be dry and usable throughout the year. Part of this land lies between Paterson and Newark. It is highly urgent that the portions of these lands needed for the parkway should be purchased before the land values are increased by such a control of the river as is proposed.

Situation and Physical Characteristics.—The irregular distribution of existing parks shows that no rule governs their selection. Political boundaries, natural attractiveness of land, accessibility, difficulty in making use of the land in other ways, cost of land, former use or ownership of property, and character of population, are some of the factors that have influenced the selection of the larger areas. Smaller areas are located in more direct relation to the populous centers, where regular daily use is to be expected. In 1927 there were 84,695 acres in parks of over 100 acres in extent, in the Region.[2] In small parks and playgrounds there were 5,307 acres.

Park use should be regarded as a permanent form of land development. Encroachments of all kinds have threatened park areas, but such efforts have

[1] See Regional Survey, Volume VIII, page 69.

[2] See Regional Survey, Volume V, page 78.

been generally unsuccessful. In some instances parks have had to be created at great cost in areas already built upon.[1]

The physical characteristics of park areas vary with the type of park use. A park used for camping and hiking has to be different from one used as an athletic field. In general and fortunately, however, the land that is most varied in topography and is least adaptable for other uses is best for a park—and gives the greatest opportunity for preserving natural beauty. Such land is ordinarily cheaper by reason of its unfitness for building. It is also more easily acquired for the same reason and is frequently left open until most nearby acreage is developed for building sites. Too often, however, its very unsuitability for good building uses means that it is used as a dumping ground for refuse or for the erection of temporary shacks. Such untidy forms of use injure the neighborhood and increase the difficulty of development for an open space. Procrastination in the acquisition of park sites is undesirable not only because of increases of land values, but mainly because the choice of the best area and the prevention of private abuses is only possible by acquiring the land in advance of building growth.

Courtesy, Long Island State Park Commission

BEACH AT SUNKEN MEADOW STATE PARK, SUFFOLK COUNTY
The park is located near Fort Salonga on the North Shore of Long Island.

The land best adapted to parkways appears to be the valleys of small streams, such as the Bronx River valley and the Saw Mill River valley in Westchester County.

[1] Columbus and Thomas Jefferson Parks in New York City, for example.

As the accompanying "before and after" illustrations show, it is precisely this kind of land that is blighted by ugly and disorderly structures and dumps. More difficult

Courtesy, Westchester County Park Commission

SAW MILL RIVER PARKWAY, WESTCHESTER COUNTY

The city garbage dump that appears in the upper picture was transformed into the pleasant park in the lower picture by the parkway construction.

to construct and maintain, but still more beautiful, are waterfront parkways on high land, such as that along the Hudson River in Upper Manhattan, and the Palisade cliffs in New Jersey. Other land can readily be treated to form attractive parkways

of less striking scenic effects. Although a parkway may take a long time to develop into a thing of beauty when it is constructed through a bare, uninteresting piece of country, it is all the greater blessing after it has been artificially created.

County Park Systems.—The standard achieved by Westchester has been taken to a large extent as a standard, both as to quality of park and as to the minimum that should be achieved, for other counties of the Region. It is realized that it may be difficult for every county to have as much acreage, or elaboration of treatment, of parks as Westchester County has, but it is financially practicable and most important that each county should solve the problem as effectively in relation to its needs as it has been solved for Westchester County. It is important to observe that the Regional

Courtesy, Union County Park Commission

ROAD IN GREEN BROOK PARK, PLAINFIELD, NEW JERSEY

Plan does not set up a higher standard than has already been attained in one part of the Region.

A comparison[1] of the parks in existence in 1921 with those of 1927 reveals considerable activity in the Counties of Union, Essex, Nassau and Suffolk, as well as in Westchester County. Proposals will be found on the Atlas for extending the park systems of these counties. Proposals will also be found for new park areas in all the other counties of the Region including the five boroughs of New York City.

Scope of Proposals.—The park proposals on the Plan include only areas of considerable size. In this connection, as in all others, it is considered the function of local planning agencies and of local park departments to provide for purely local needs.[2]

[1] See Regional Survey, Volume V, pages 50–51.

[2] For a discussion of playground adequacy, see Regional Survey, Volume V, page 157.

Whether the areas that are proposed should be owned and maintained by the state, the county, or the municipality is also a matter outside the scope of the Plan. The general purpose of the system of parks is to provide for public recreation. The exact amount and the exact location of park lands that will be needed for public recreation by 1965 cannot be determined now, but if the Regional Plan proposals were adopted, they would provide an ample supply of open area peculiarly adapted to park development by reason of desirable physical characteristics, reasonable availability, and location in relation to population and its movement.

The peculiar advantages of regional park proposals lie in the co-ordination of

Photo by Fairchild Aerial Surveys, Inc.

PARKWAY PROPOSALS IN THE EASTERN PART OF ROCKLAND COUNTY

The topography and geography of Rockland and Bergen Counties offer opportunity for the development of a park system comparable to that of Westchester County.

existing parks and parkways with proposed parks and parkways to form a unified, comprehensive park system[1] for the Region as a whole. Questions of balance, accessibility and physical desirability have all been studied from the point of view of the whole Region and of each locality. Although the proposals relate to regional distribution and movement of population, they also harmonize with local needs and interests. The selection of the proposals shown is the result of combined field and map study and should prove an adequate starting point for future park programs.

Too much emphasis cannot be placed upon the fact that the intent of the Plan is to combine the existing parks, parkways and boulevards with proposed parks, parkways and boulevards so as to form a complete and unified system for the Region.

[1] See Pocket Map No. 4 at the back of this volume, showing the general plan of the park system.

Existing facilities have been described in the Regional Survey, Volume V, and only a list of the proposals are included in this volume.

The major proposals for extending the park system will be discussed under two headings: (a) Large park proposals in the environs; (b) proposed parks in New York City. Fig. 25 is a key plan showing their location.

These two groups have been further classified into sub-groups depending upon their functions as "compact park areas" or as "ribbon parks." In the case of the latter the general shape is the same as that of the parkway; in fact, ribbon parks are potential parkways needing only a major or minor regional roadway within their bounds to make them come under the definition that has been adopted for the parkway. The numbering system of all the park proposals is independent of the classification.

Large Park Proposals in the Environs.—The park proposals described in the environs include only the areas having considerable acreage. It will be noticed that the description of each of the sub-classes begins in the Sandy Hook section and extends in a clockwise direction around the Region, terminating on Long Island.

Compact Park Areas

(1) *The Highlands of Navesink* offer along their southerly slopes an area that is adaptable for park use. The northerly shore would have been the logical site if it had been acquired before development had rendered it impractical. The southerly slope, however, possesses the same general character; it is largely wooded, interesting in contour, and overlooks the broad Navesink River.

(2) *The Mount Pleasant Hills* of Monmouth County between Morganville and Holmdel offer an opportunity for the location of a large park comparable to the Poundridge Reservation in Westchester County. It is in the general line of traffic from New York to Asbury Park and Atlantic City; it is reasonably near to present and expected population, which, although within reach of the recreational advantages of the shore, will find a delightful change in hilly land.

(3) *The Bluffs of the Raritan River* at New Brunswick afford excellent opportunity for a regional park. This would meet local needs and also become a feature in the park system at the junction of the Raritan River Parkway and the proposed parkway which parallels the Lincoln Highway from Rahway to New Brunswick.

(4) *A park east of Metuchen*, about a mile distant, is proposed for an area which lends itself to the development of a large recreation center. The area is somewhat over a square mile in extent, is partly wooded, includes both hilly and comparatively level land and has exceptional facilities of access.

(5) *Parts of the Watchung Mountains* offer advantages for park purposes, which have already been recognized by the formation of Eagle Rock Reservation, South Mountain Reservation and Watchung Reservation. It is proposed to make more general use of these mountains by appropriating a considerable area northerly from the Watchung Reservation, and also the steep hillside that extends to the southwest beyond Chimney Rock. At Chimney Rock it is proposed to construct a dam to form a water storage area. The shores of the lake thus formed would have to be controlled and could afford a restricted recreational use.

(6) *Between Plainfield and Rahway* three-quarters of a square mile of swamp land is suggested for public recreation. It is known as Ash Swamp. It is practically equidistant from the communities of Plainfield, Westfield, Cranford, Rahway and Metuchen.

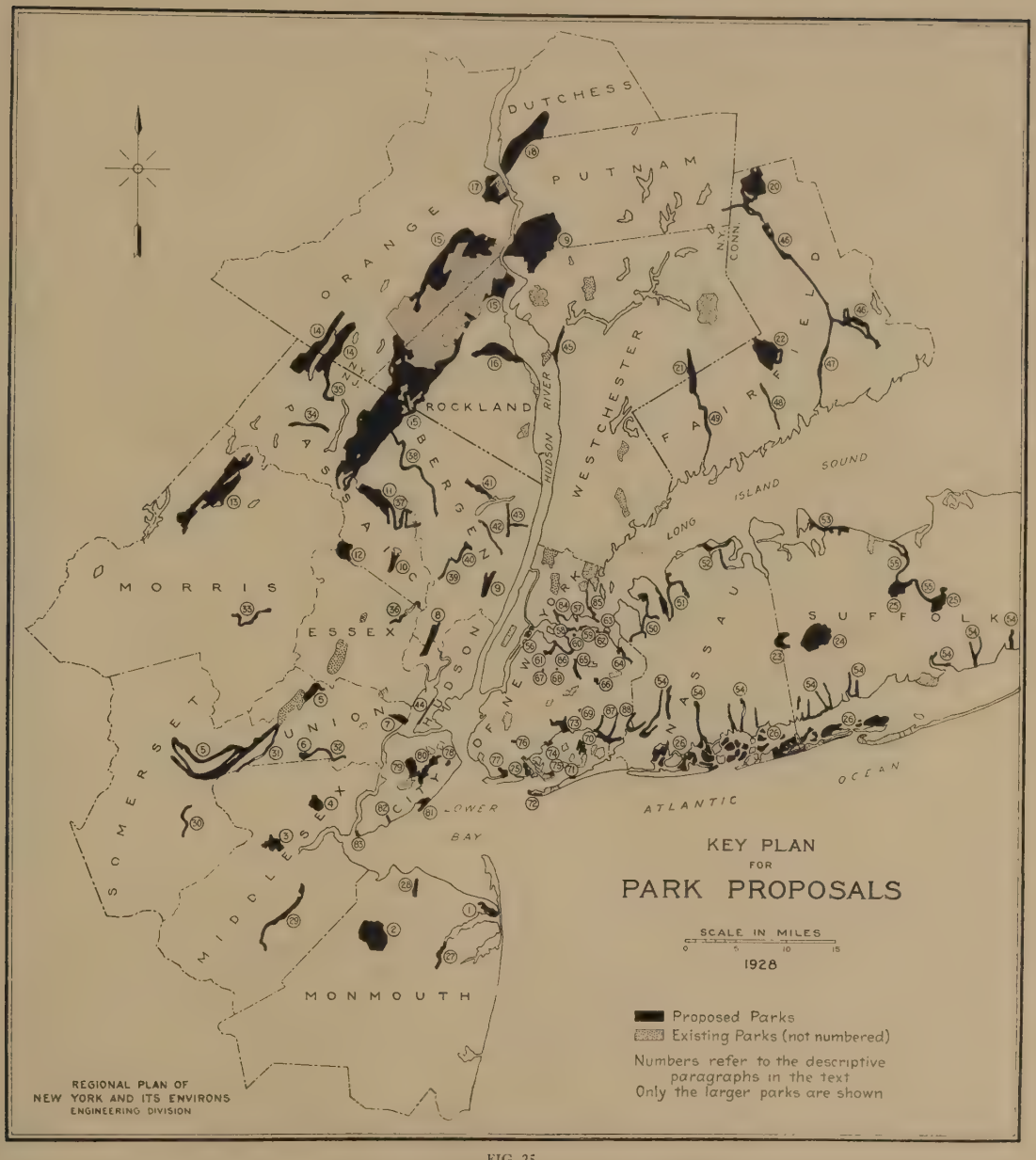

DUTCHESS
PUTNAM
ORANGE
ROCKLAND
WESTCHESTER
FAIRFIELD
N.Y.
CONN.
HUDSON RIVER
PASSAIC
BERGEN
MORRIS
ESSEX
HUDSON
UNION
SOMERSET
MIDDLESEX
MONMOUTH
LONG ISLAND SOUND
NASSAU
SUFFOLK
ATLANTIC OCEAN
LOWER BAY
KEY PLAN
FOR
PARK PROPOSALS
SCALE IN MILES
0 5 10 15
1928
Proposed Parks
Existing Parks (not numbered)
Numbers refer to the descriptive paragraphs in the text
Only the larger parks are shown
REGIONAL PLAN OF
NEW YORK AND ITS ENVIRONS
ENGINEERING DIVISION

FIG. 25

(7) *Fronting on Newark Bay* and extending nearly a mile in width inland to the built-up section of Elizabeth is an area of meadow land proposed for park use. This is the only park proposal on the westerly shore of Newark Bay. Nearly two square miles in area, it will be able to supply space for a variety of recreational activities.

(8) *In the lower part of the Hackensack meadows* near its westerly bounds are about two square miles of meadow land proposed as a public reservation. Adjacent land will be closely developed and it is important to preserve an open area in this locality before other land is put to industrial or residential use. This area could be used as a bird sanctuary and would also serve the recreational needs of the workers in the factories and provide an open prospect for residents on the adjacent high land.

Photo by Fairchild Aerial Surveys, Inc.

PROPOSED PARK SOUTH OF PATERSON

The thin white line represents the suggested boundary of the park where it is not bounded by a highway.

(9) *The lowlands in the valley of Overpeck Creek* present at once a problem and an opportunity. Considerations of prevailing wind directions, of adjacent high class residential occupancy, and of availability of other industrial sites point to the desirability of the exclusion of industrial use from this valley. The type of residential development that would normally take place on this land would be injurious to the whole neighborhood. On the other hand, it offers an opportunity for the development, by the construction of a dam, of a large marine park that would be a boon to the immediate vicinity and an attractive park for visitors from all parts of the Region.

(10) *An extension of the existing Garret Mountain area* (until recently property of the City of Paterson, open to the public but not dedicated for park purposes; since acquired by the newly created Passaic County Park Commission) immediately south of Paterson appears to be the logical place for a large park in that general locality. Its altitude, its woods and water, combined with its proximity to the populous center of Paterson, are considerations in suggesting it as a public park.

(11) *Preakness Mountain*, including High Mountain, northwest of Paterson, offers a wild and rugged landscape comparable to that of Bear Mountain Park. Its nearness to population makes it especially suitable for a country park. It is also fortunate in having possible parkway approaches from Paterson.

(12) *Between Mountain View and Two Bridges* is an area that is distinctly favorable for a park. It includes the junction of the Rockaway River with the Pompton River, and also the easterly tip of Hook Mountain. It also forms a feature at the junction of the proposed parkway along the Pompton River with the proposed parkway to Lake Hopatcong which is largely along the bed of the Morris Canal.

Courtesy, Palisades Interstate Park Commission

VIEW SHOWING THE GENERAL CHARACTER OF THE COUNTRY ABOUT BEAR MOUNTAIN BRIDGE

It is proposed to include the Dunderberg Mountain (background, center) in Bear Mountain Park.

Part of this land might be used temporarily with advantage for the erection of summer cottages under proper supervision, renting plots on short term leases.

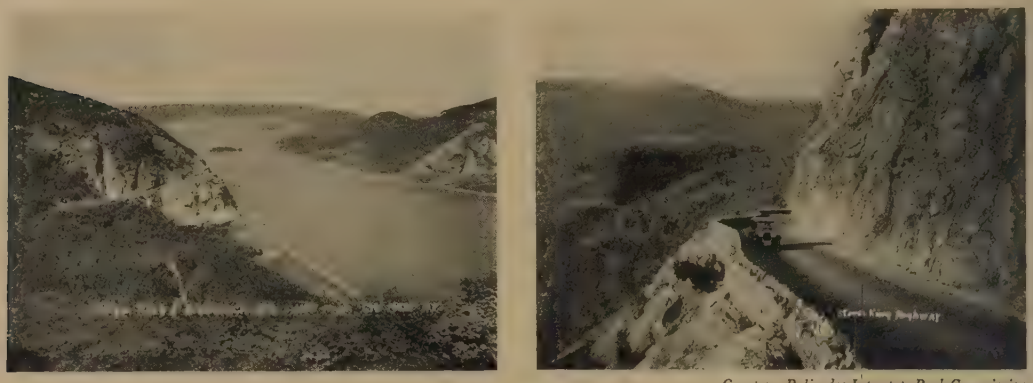
(13) *East of Lake Hopatcong* extending northeast from the Picatinny Arsenal is an area of wild and rugged mountains interspersed with numerous lakes. The same facilities of access that serve the privately established recreational areas of Lake Hopatcong will also serve the proposed park area. The types of recreation provided in this area will for the most part supplement the activities of Lake Hopatcong rather than compete with them. The suggested area includes portions of the Brookland Mountains, the Green Pond Mountains, and the Copperas Mountains, also Denmark Pond, Green Pond, and the part of Rockaway River in Longwood Valley.

(14) *Greenwood Lake*, partly in New York and partly in New Jersey, presents a peculiarly favorable opportunity for park development. A large body of water with high elevations near the shores, it

would make an excellent objective for week-end visitors. Some of its shore is already occupied with private development, but for the most part it is still available.

(15) *Extension of Bear Mountain Park*[1] southerly along the Ramapo Mountains seems to be the logical use of these mountains. Suggestions for rounding out the boundaries of the present Bear Mountain Park, together with the extension to Pompton Lakes, would make a total additional area about as large as the existing park. A limited park use has already been made of this area, evidence of which is the number of hiking trails in this section of the mountains.[2]

(16) *High Tor and Little Tor* are two mountain peaks southwesterly from Haverstraw, with elevations of 830 feet and 710 feet, respectively. These points are the highest in a ridge which extends to the west, to within a mile and a half of the boundary of Bear Mountain Park. It forms a logical extension of the part of Palisades Interstate Park that borders on the Tappan Sea.



Courtesy, Palisades Interstate Park Commission

VIEWS OF THE STORM KING HIGHWAY IN THE PALISADES INTERSTATE PARK

(17) *At Storm King Mountain* a portion of the Palisades Interstate Park should be extended to the south to meet the West Point boundary, and west to include the whole of Storm King Mountain.

(18) *In Putnam and Dutchess Counties*, extending from the Hudson River along the county boundary, is an area of rugged topography nearly two miles in width and over five miles in length. It is accessible by railroad, river and highway, and possesses physical characteristics which make it desirable for recreation.

(19) *North of Peekskill* is an area about four miles wide and five miles long which could be readily adapted to the type of recreational use that has been encouraged in Bear Mountain Park. It may be regarded as an extension of Bear Mountain Park across the Hudson River. Its location, together with its interesting arrangement of hills, valleys, lakes and streams, makes it peculiarly valuable for such a park.

(20) *Northwest of Danbury* is a hilly region containing a number of reservoir lakes. Public ownership is desirable as a protection to the water supply. With such restrictions as are needed to insure the purity of the water the area could also serve valuable recreational purposes.

[1] See Regional Survey, Volume V, page 82. Since the Plan was proposed valuable extensions have been made to Bear Mountain Park.

[2] See page 361.

Courtesy, Westchester County Park Commission

FIG. 26

(21) *Along the Mianus River* between Bedford, New York, and Stanwich, Connecticut, there is proposed a considerable park area between four and five miles in length and over a half mile in width. One of the most beautiful natural features in the Region is the rare Mianus Gorge which would constitute the central motive or the point of greatest interest in this park. Even if it were practicable to construct a parkway road along the river it would be undesirable because it would disturb the character of the landscape. A parkway is suggested along the west border of the area at a distance of nearly a half mile from the river in order to furnish access to the park. There is sufficient land for recreational use in the proposed park area away from the banks of the river, the unusual beauty of which should be preserved.

Courtesy, Long Island State Park Commission

BELMONT LAKE STATE PARK, BABYLON, LONG ISLAND

(22) *Two miles northeast of New Canaan* is an area about two and one-half miles long and about two miles wide possessing certain advantages, by reason of location and physical characteristics, which make it suited for public recreation. It is about the same distance from New York City as Blue Mountain Reservation, Mohansic Park, and Poundridge Reservation, and forms a link of the chain made by these parks that extends from the Hudson River to the Long Island Sound. It is surprisingly near to, and accessible from, New Canaan and the populous centers on the north shore of the Sound. It also fills a gap in the system of distribution of recreational space in the Region. It is bordered on the southwest by the Silvermine River along which is proposed a parkway from Norwalk to Poundridge Reservation. It is largely wooded and has a number of reservoirs, lakes and lake sites.

(23) *The southern portions of the Manetto Hills*, partly in Nassau County and partly in Suffolk County, are suggested as an available and attractive park site. These hills offer practically the same advantages as the Half Hollow Hills and are at least as readily accessible.

(24) *The Half Hollow Hills* of Suffolk County offer an area of approximately six square miles that would make an excellent park. It is largely wooded and accessible to New York City by railroad, highway and parkway.

(25) *Lake Ronkonkoma* and *New Mill Pond* provide water attractions about which two park proposals are suggested. Both areas are over a square mile in extent. The former is immediately south

of the community of Smithtown; the latter includes the westerly shore of Lake Ronkonkoma, but the bulk of it lies to the southwest of the lake. These areas are beyond the boundaries of the Atlas but will be found on Fig. 25 and also on Pocket Map No. 4.

(26) *The islands in the bays along the South Shore of Long Island* are for the most part marshy, and for that reason ill adapted to intensive use of any sort. The extent to which these lands have been put to use is very slight. No definite proposals are made with regard to their development but it is suggested that no development should be made without the reservation of large areas for recreation. The quiet, warm waters of the shallow bays make bathing safe and delightful at times when the sea is rough and cold.

Photo by Fairchild Aerial Surveys, Inc.

PROPOSALS ALONG SOUTH SHORE OF NASSAU COUNTY ADJACENT TO NEW YORK CITY

Areas with light tint and bordered with white lines are islands proposed as parks.

RIBBON PARKS

(27) Along *Swimming River* from parkway route[1] No. 1 to Red Bank.

(28) Along *Waackaack Creek* between parkway route[1] No. 1 and Keansburg.

(29) Along *South River* from parkway route[1] No. 1, south through Old Bridge, Spotswood, Helmetta and Jamesburg. For the greater part it is alongside the proposed New Jersey Ship Canal.

(30) Along the *Millstone River* between Millstone and the junction of the Millstone and Raritan Rivers.

(31) Along *Green Brook* from parkway route[1] No. 3 at Scotch Plains through Plainfield to Dunnellen.

(32) Along *Robinson Branch* between Ash Swamp and Rahway.

(33) Along *Whippany River* from the western part of Morristown, through Morristown to Whippany.

(34) Between *Echo Lake* and the Wanaque Reservoir, partly along West Brook.

(35) Between *Greenwood Lake* and Wanaque Reservoir along the Greenwood Lake Branch of the Erie Railroad.

(36) Along the *Yantecaw River* (Third River) between Bloomfield and the Passaic River.

[1] See Fig. 20, page 273.

(37) North of *Paterson*, an irregular strip of park between Route A and the Passaic River from radial highway Route 11 to highway S-14; thence northerly along Goffle Brook about two miles; thence across to the mountainside which it follows back to Prospect Park. From this point it turns northerly again through North Haledon and terminates in the Preakness Mountain Park (proposal No. 11).

(38) Along *Hohokus Creek* from its junction with the Saddle River northward through Ridgewood, Waldwick, Allendale; thence northwesterly to parkway route No. 8 at Darlington.

(39) Along *Saddle River* between the Passaic River Parkway at Garfield to Rochelle Park, where it joins the Saddle River Parkway.

(40) Between *Rochelle Park and Cherry Hill* following for the most part highways "g" and A. This ribbon park connects the Saddle River Parkway with the Hackensack River Parkway.

(41) Between *Oradell Reservoir* and Woodcliff Lake along the line of Route B between these points.

(42) Between *Englewood* and Oradell following the valleys of two small streams for the greater part of the way.

(43) Along *Tienekill Creek* between Closter and Tenafly with a branch extending from Cresskill to the Palisades cliff below Alpine.

(44) Along the *east side of Newark Bay* in Bayonne, between the Central Railroad of New Jersey and Pennsylvania-Lehigh Valley Railroad bridges.

(45) Along *Croton River* between the Hudson River and the New Croton Reservoir.

(46) Between *Brewster and Bridgeport* parallel with existing roads. At Brewster it extends along outer circumferential highway Route C-2 to Mill Plain. It then turns southerly at Lake Kenosha past the Danbury fair grounds to radial highway Route 6, along which it extends through Spruce Mountain Park; it then follows the road to West Redding, where it enters the valley of the *Saugatuck River*. Continuing along this valley until it meets outer circumferential highway Route C, it follows the highway past Hemlock Reservoir to parkway and boulevard route No. 18 about two miles from Bridgeport.

(47) Along the *Saugatuck River* from the point where No. 46 described above leaves the river to Long Island Sound.

(48) Along the *Five-Mile River* between New Canaan and West Norwalk.

(49) Along the *Mianus River* between radial highway Route 6 and Coscob Harbor.

(50) Along the easterly shore of *Manhasset Bay* with an extension southwesterly along the railroad to the New York City line.

(51) Extending around the shore of *Hempstead Harbor*, also about two miles along the small stream through Glen Cove.

(52) The westerly shore of *Oyster Bay Harbor* with an extension south of Bayville.

(53) At *Northport Bay* the narrow strip of land between Eaton Neck and Asharoken Beach with an extension easterly along the shore about two miles in length.

(54) A number of small strips of park land are proposed along the small streams of the *South Shore of Long Island*. Some of these have roadways proposed in them and are described under Parkways. They are referred to in Survey Volume V[1] as "neglected opportunities along the South Shore."

(55) The banks of the *Nissequogue River* from Long Island Sound to New Mill Pond, with a connection thence to the portion of park proposal No. 25 at Lake Ronkonkoma.

Proposed Parks in New York City.—The areas of proposed parks within New York City are in general smaller than those listed outside the city. Want of available undeveloped land is naturally a large factor in restricting the choice of areas. They

[1] Page 195.

are listed below in order according as they are situated in Manhattan, The Bronx, Queens, Brooklyn or Staten Island.

Compact Park Areas

(56) East River Islands: Randalls Island, parts of Wards Island and Blackwells Island.[1]

(57) Old Ferry Point; a proposed bridge approach.

(58) College Point; an area one-quarter of a mile in width and about a mile long, fronting on the East River between Flushing Bay and Powell Cove.

(59) Whitestone Point; also east shore of Powell Cove, making a local park and an approach for the proposed bridge at Old Ferry Point.

(60) Community of College Point; a local interior park about a quarter of a mile square.

(61) Jackson Heights; an interior area of meadowland about a half mile square.[2]

(62) Whitestone; a local waterfront park with a quarter of a mile frontage on Little Bay.

(63) Willets Point; frontages afforded on Little Bay and on Little Neck Bay.

(64) Head of Little Neck Bay; meadow land a half mile in width extending inland beyond Nassau Boulevard to the proposed alignment of Grand Central Parkway and including Alley Pond.

(65) Flushing Creek Meadows; an area two miles in length and averaging a half mile in width, extending along the upper portion of Flushing Creek.

(66) Upland Park Extension; north of Upland Park, an irregular area through which passes the proposed Grand Central Parkway.

(67) Mt. Zion Cemetery; small local park along the eastern boundary of the cemetery.

(68) Queens Boulevard; a local park at the intersection of Queens Boulevard with Nassau Boulevard.

(69) Aqueduct; an area of about a quarter of a square mile.

(70) Islands of Jamaica Bay; roughly in the center of the Bay, partly in Queens and partly in Brooklyn, including a number of islands between Pumpkinpatch Channel and Broad Channel.

(71) Beach Channel; a small waterfront area in Rockaway.

(72) Rockaway Point; an extension beyond Fort Tilden of the Rockaway ocean front.

(73) Spring Brook; over a square mile partly in Queens and partly in Brooklyn, with a half mile frontage on Jamaica Bay and having a northerly extension to the projected Linden Boulevard and a westerly extension along Fairfield Avenue to Pennsylvania Avenue.

(74) Canarsie; extension of existing park along Jamaica Bay making a waterfrontage of three-quarters of a mile.

(75) Marine Park Extension; part of Barren Island, a small area between Flatbush Avenue and the existing park, and a connection along Knapp Street from Sheepshead Bay to the existing park.

(76) Old Flatbush Golf Club; a much needed space between Ocean Avenue and Flatbush Avenue north of the Long Island Railroad. When an attempt is made to purchase this area, it may be found too expensive for park use, particularly in view of an apparent lack of local interest in it as a possible park. A substitute for this site might well be the land now owned by the Flatbush Waterworks not a half mile from the golf club. It appears that the wells will eventually be abandoned and that the city will

[1] See Regional Survey, Volume V, pages 181–186.

[2] On March 16, 1929, the Holmes Airport was officially opened in this locality. There is still opportunity for a park or parks along the borders of the airport.

purchase the land, as that is the only way in which it can cancel the Waterworks Company's rights. Furthermore this site is a natural park. It is in a valley some 25 feet below abutting street grades; it possesses a fine growth of trees, and is even larger than the golf club site.

(77) Coney Island Creek; about a half square mile north of Coney Island Creek and west of Ocean Parkway.

(78) Narrows Crossing; an approach plaza and park at Grassmere, Staten Island.

(79) Willow Brook; an extensive area in the center of Staten Island.

Photo by Hamilton Maxwell, Inc.

PARKS PROPOSED NEAR CONEY ISLAND AND GRAVESEND BAY
The principal highways related to the parks are also shown.

(80) La Tourette Park Extension; to include an area about two miles long and averaging a half mile in width, extending northeasterly from the recently acquired park.

(81) Great Kills; an opportunity for the location of an exceptional marine park.

(82) Prince's Bay; three-tenths of a square mile extending from Prince's Bay to the ocean. This area includes Wolfe's Pond.

(83) Ward Point; a strip of shore at the southerly point of Staten Island.

Ribbon Parks

(84) Along the shores of the *Bronx River* between the metropolitan highway loop and the East River.

(85) Along *Eastchester Bay* and Long Island Sound between Pelham Bay Park and Throgs Neck.

(86) Along *Flushing Bay* from College Point to Sanford Point with an extension inland from Sanford Point to park proposal No. 61.

(87) East end of *Jamaica Bay;* from Van Wyck Boulevard along the shore to within a mile of Nassau County, with an extension inland along a creek to Baisley's Pond Park and also one along the mapped Springfield Boulevard to Springfield.

(88) Along the small stream that follows Brookville Road from *Simonsons Pond* to boulevard route No. 32, including *Conselyeas Pond.*

Water Supply Reservations

The existing areas acquired and reserved in connection with municipal water systems in the Region are indicated with a green ruling on the Graphic Plan. Although the original object of making these reservations was to collect, store or convey water they have provided valuable open spaces, and their occasional and limited use has afforded a large measure of enjoyment to the people of the Region. The dams, bridges, aeration plants, and lakes with evergreen parks surrounding the lake shores are features of interest that attract people from all over the country. Wherever a highway passes through the properties it has all the characteristics of a parkway. The right-of-way of the aqueduct provides an attractive hiking trail.

Any use of these areas as parks must be subordinate to their primary uses of protecting water supplies; but their scenic attractiveness is a source of great enjoyment and may present

THREE VIEWS OF THE LOWER BRONX RIVER

The upper view is at the lower end of Bronx Park; the center one looking south from East 180th Street; and the lower one near the mouth of the River. It is proposed that the banks of the stream below Bronx Park be acquired for park use.

great future possibilities for recreation. If and when properties of this kind are abandoned for water supply purposes they will naturally tend to be converted into parks because of the character and ownership of the property. Even while still in use as water reservations it is possible, however, to permit a restricted use of the public lands near to the reservoirs for recreation without injury to the water supplies. Picnic places, well policed, could be provided in certain places, as

Photo by Fairchild Aerial Surveys, Inc.

THE CROTON DAM AND RESERVOIR
Part of the water supply system of New York City.

has been done in the water supply properties owned by the City of Newark in the Pequannock River watershed, and trails or parkways along the aqueducts could be made. Partly because these areas are really pleasure parks even while the public is denied access within their boundaries and partly because of an expected increase in their use for recreation, the proposed parks and reservoir lands are shown in the same symbol on the Atlas. The suggested combination of uses would probably entail and justify the purchase of a larger margin of land around the reservoir lakes than has been secured in the past. This would be desirable in the interest of the water supply itself and several such extensions of existing water supply properties are proposed.

Bridle Paths and Hiking Trails

One of the important problems that has to be considered in connection with the planning of modern cities and their environs is that of making provision for riding paths and hiking trails. These are needed for the purposes of removing from the

Courtesy, Long Island State Park Commission

VALLEY STREAM STATE PARK, LONG ISLAND
The lake was formerly an active unit of the New York City water supply system.

highways forms of traffic that interfere with vehicular use and, simultaneously, of providing facilities for important kinds of recreation.

In the inner zone of the Region bridle paths and hiking trails for obvious reasons have to be located within public parks, parkways or boulevards. In the more remote parts of the Region they are located partly on private and partly on public property. A discussion of these paths belongs under the heading of public recreation. They are

FIG. 27
EASTHAMPTON BRIDLE PATHS

in fact lines of circulation, but the consideration of getting from one point to another is subordinate, in the case of paths and trails, to their use for recreation. As a rule a limited amount of public use of the trails and paths over private property appears to

FIG. 28

BRIDLE PATHS IN THE VICINITY OF GREENWICH AND RYE

be practicable without unduly interfering with the private uses. A more intensive public use tends to lead to abuses which make policing necessary and public ownership advisable.[1]

It is impossible to show complete systems of facilities for these paths and trails on a map of the scale used for making a regional plan. In any case the planning of detailed development of this character is really a matter to be dealt with in a city and not in a regional plan. Every community should include, as part of its plan, ample provision for a permanent system of paths and trails for purposes both of ancillary means of circulation and of active recreation. Within the city, it is as important as in the country that such riding paths as exist in Central Park should be extended so as to connect with similar paths in parks and open country outside the city. On the other hand hiking trails should be planned not only in such country parks as Bear Mountain Park but also through the parkways and along the fringes of the highways that connect the park system.

An admirable series of paths for pedestrians has been provided in connection with the Westchester Park system. This system also includes a number of riding paths. While, for reasons stated, the Regional Plan does not indicate a general system of paths and trails, illustrations are shown (Figs. 27, 28 and 29) of two areas in which an extensive system of riding paths exists, and of one area in which existing hiking trails are shown as an extension of the system of trails in Bear Mountain Park. A fourth illustration, Fig. 30 (page 362), shows two trails, one on each side of the Hudson River, proposed as approaches to Bear Mountain Park from New York City. The following is a brief description of the four local systems:

Easthampton Bridle Paths.—This area has been selected as typical of a number of places in the Region that have systems of bridle paths. The public roads of the community constitute an integral part of the system. The remainder consists of roads and trails on private holdings. Naturally the macadam roads are less desirable for riding because the hard, slippery footing is not good for horses, and in general there is more automobile traffic on the surfaced roads. It will be noticed on the map of Easthampton that the trails are away from the populous center where holdings are relatively large.

The extent of bridle paths in this part of the Region is indicated by the following quotation:[2]

"Radiating from the country clubs of the Long Island region, there are over 400 miles of bridle paths, for the most part through private estates, hidden from those who see Long Island from the seat of an automobile; there are also ninety miles or more in Westchester County."

Greenwich-Rye Bridle Paths.—This area is also very well supplied with riding paths and is suggestive of the way in which other communities of the Region might well enjoy this form of recreation. It should be distinctly understood that the pub-

[1] For further discussion see Regional Survey, Volume V.

[2] *The Rider and Driver*, October 29, 1927.

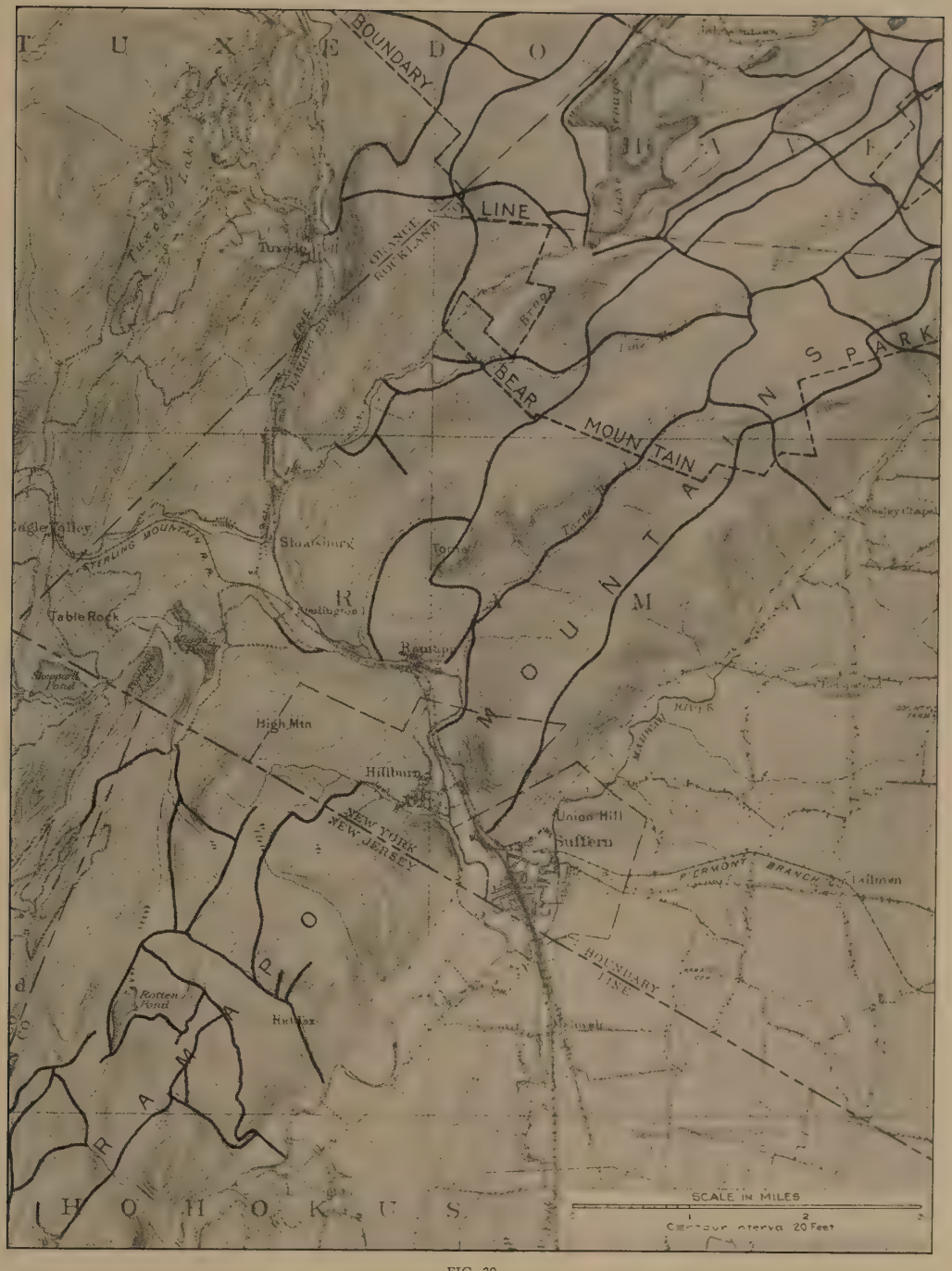


FIG. 29

EXTENSION OF BEAR MOUNTAIN HIKING TRAILS

FIG. 30

HIKING TRAIL APPROACHES TO BEAR MOUNTAIN PARK

lication of these maps is not an invitation to the general public to use the bridle paths. It is rather an invitation to other communities of the Region to follow a good example. The paths shown here are partly on public land and partly on private land and for that reason may be said to have a limited, semi-public use, especially the paths on private property. There are good reasons why cities, towns and villages should develop systems of paths along road lines, using the margins along the sides of the rights-of-way that are surfaced and the roads themselves that are not surfaced. These could be supplemented with paths along boulevards and parkways and through parks.

Three paragraphs are quoted below from the "Rules and Regulations" of the Greenwich Riding Association, Incorporated; most of the paths of this club are included in Fig. 28 as well as most of those of the Rye Riding Association.

"All members must keep to the bridle paths and cross-country lines laid out and marked by the Corporation. They must not ride over fields, or jump walls or fences, except on the paths and lines which have been laid out and marked. The privileges given to the Corporation by property owners are confined to these bridle paths and cross-country lines and their limitations must be strictly respected in order that the privileges of the Corporation may be preserved for its members.

"Members must not ride over growing crops, must always close gates and replace rails, and must promptly report any damage done, so that the Corporation may at once repair such damage and maintain the privileges accorded to its members by the property owners.

"Members may invite guests to accompany them, but must assume responsibility for the observance by their guests of all rules of the Corporation."

Extension of Bear Mountain Hiking Trails.—The admirably planned system of hiking trails that has been developed in Bear Mountain Park is shown in the regional survey.[1] Fig. 29 shows a portion of Bear Mountain Park including the most important of these trails in the southerly section; it also shows other existing trails which provide an extension of them southwesterly along the Ramapo Mountains.

It is significant to note that the trails shown in the illustration which are outside of Bear Mountain Park and in the Ramapo Mountains, appear in an area that is suggested as a future park (park proposal No. 15). It is most fitting that this area, which has been enjoyed by numbers of people in the past, should be preserved for the pleasure of the public in the future.

Approaches to Bear Mountain Park.—Although the principal means of getting to Bear Mountain Park will continue to be by rail, highway and water, it is distinctly desirable that hiking trail approaches be provided from New York City. Two such trails are shown in Fig. 30. One begins at Central Park, follows 110th Street (which is proposed as a boulevard on the Plan) to Riverside Park; thence it crosses the river on the bridge now under construction at Fort Lee. The trail then passes along the western shore of the river to Bear Mountain Park, utilizing existing park trails, existing privately owned trails, existing roads and a few new connections.

The other trail begins at Van Cortlandt Park and continues on the eastern side of the river to Bear Mountain Bridge. It is located partly on parkways of the Westchester County park system and partly on the line of the old Croton Aqueduct. Portions of the latter are used extensively for hiking at present.

The idea of approach trails to outlying recreational facilities should be made more general. The trails described above constitute a sample of what should be done in places other than the district about the Hudson River.

Semi-Public Open Spaces

Grouped under the general heading of semi-public open spaces there are a considerable number and variety of areas. They include areas for golf and country clubs, for educational and correctional institutions, in large estates, and for cemeteries. The resistance to change from these to other uses varies according to the degree of permanency of occupancy of the land. No change may be expected in cemetery use, whereas a rented golf course is likely to undergo early development for building purposes. It is a common characteristic of all these areas that only a small percentage of the land is built upon. Their importance in the Regional Plan consists of first, the extent to which they provide "lung" spaces, usually where these are much wanted for the community; second, their possible future use for recreation purposes; third, the effect they have in facilitating or hindering circulation, or in distributing popula-

[1] Regional Survey, Volume V, page 82.

tion; and fourth, their value in contributing to or detracting from the beauty and orderliness of a neighborhood.

The Graphic Regional Plan shows all existing semi-public open spaces together with the airplane landing fields and military reservations, with a single color pattern, using symbols to differentiate the classes. No proposals for extension or increase of these spaces are shown except for airplane landing fields. This limitation does not imply that no expansions or changes are expected for the other semi-public uses, but rather that there is no basis at present for suggesting definite locations for the majority of such uses.

Golf and Country Clubs.—In 1923 a study[1] made of golf and country clubs in the Region revealed the fact that 159 clubs with a membership of 51,849 had an acreage of 21,165, with an assessed valuation of $21,255,025. These figures give some idea of the popularity and importance of this form of recreation. The golf courses are located outside the closely built portions of the Region. The figures quoted are for 1923. Since that time a large number of new courses have been developed, some of the older ones have been subdivided for building purposes and others have been moved to new localities. In 1928 there were over 200 clubs not counting nine courses in public parks.

The use of land for golf courses is probably the least permanent of the semi-public open spaces. A large percentage of the property used by golf clubs is rented. In Westchester County, for example, in 1923, over one-fourth of the total number of clubs rented at least half of the land; and most of the clubs of this number rented all the land. With the pressure of the demand for building land by the increasing population, clubs are forced to abandon areas near to the populous center and seek land in more remote localities. If this process resulted in the golf courses being converted in whole or in part into public parks the change would be, in many cases, a desirable one. But in most cases the land relinquished by the golf clubs is considered to be too high in cost for park purposes.

Where golf and country club properties exist, or are established, the value of abutting land tends to increase. In some instances a golf club is established for the purpose of promoting a high class residential settlement. The social life of a district is often centered in such a club and the club determines the character of a neighborhood. When adjacent land around golf courses has been developed with residences, the golf course may then be subdivided at great profit to the members of the club.

Cemeteries.—The Plan shows in outline cemeteries over ten acres in area; it indicates by a green symbol in the shape of a "cross" the approximate location of cemeteries between one and ten acres in area. Cemeteries are naturally enduring forms of land use; even the almost irresistible pressure of demands for land and the high values of lower Manhattan have not caused the graveyards about St. Paul's Church and Trinity Church to be abandoned. In many cases where cemeteries impede the

[1] Regional Survey, Volume V, page 240.

circulation of traffic it has been extremely difficult to secure rights-of-way through them, particularly where the land was already in use for burial. The long delays which have occurred in connection with the project for the Interborough Parkway in the borough of Queens furnish an outstanding example of this difficulty.

Cemeteries, like parks, should never be of such a size in one parcel of land as to create a serious obstruction to traffic. It should be assumed by those who select and plan areas for this purpose that the adjoining areas will be built upon and that some means of communication through the larger cemeteries will be necessary in course of time to prevent serious public inconvenience and traffic congestion. Owners of burial-grounds property naturally resent proposals to construct highways or streets through such grounds, even when full compensation is made for disturbance and removal. The difficulties now being experienced in Queens and Brooklyn in getting necessary highway connections across cemeteries is an instance of their effects in obstructing normal circulation. But cemeteries can be planned, in respect to size and boundary, and in relation to prospective traffic needs. Most cases where difficulties now occur could have been avoided by the exercise of more foresight. Where, however, these difficulties cannot be foreseen it becomes inevitable in time to permit roads to displace some part of the burial use.

Land values of property usually suffer some depreciation as a result of proximity to cemeteries. This is true particularly of the land best adapted or in use for residential purposes. Naturally different types of cemeteries, and the relative degrees of spaciousness they possess, have different effects on the public attitude towards them. Cemeteries are now being laid out in more park-like form and have, generally, fewer objectionable features than formerly. Where it is practicable to limit or even prevent the erection of vertical monuments, and maintain much space for planting of trees and shrubs, a cemetery may take on more of the character of a park and thus become a comparatively attractive open space.

Apart from the degree of openness cemeteries give to a neighborhood, they should not be looked upon as areas to be ultimately converted into public parks or playgrounds, and therefore as lessening the need for providing these recreation areas. In some cases cemeteries have been so converted but only as a last resort to meet some desperate need for public space. A park or a playground is really less of a desecration to a burial ground than a commercial use, and after a long interval the conversion of a cemetery into a restful park or even a place for outdoor play may be entirely justified. The selection of new areas for cemeteries, their layout and landscape treatment is, of course, a problem of local and not of regional planning. The important thing to point out here is the necessity of their being planned as part of a comprehensive scheme and under the advice of a skilled landscape architect.

Larger Institutions.—On the Plan Atlas institutions that occupy over fifty acres of land are included in the classification of semi-public open spaces. Some of the more

important institutions within the built-up area of the Region are situated in areas of less than fifty acres. Most of these estates include land that is used for some kind of recreation. In built-up sections properties of this class help to reduce average building densities and thereby to lessen causes of congestion. On the other hand, they may be so situated and large in size as to impede traffic circulation for a time. But like golf clubs they yield to the pressure brought about by expanding urban growth and are moved outwards as a result of this growth and the changed economic conditions to which it gives rise. Little advantage is ordinarily taken of the opportunity which the transfer of these institutions gives to obtain land for new parks, and under normal conditions the land is converted into building use for close development. Much more should be done to acquire some part at least of these semi-public open spaces for permanent public use—before they become "ripe" for building development and are divided into parcels under separate ownership.

Airplane Landing Fields

Airplane landing fields are classified in the legend and shown in the same color symbol on the map as "semi-public open spaces." Landing fields are really in a class apart from other forms of open space, and are themselves divisible into military, public and private landing fields. They do, however, really come within the "semi-public" designation in regard to the degree of general public use that may be made of them. Probably, in course of time, there will be much use made both of parts of landing fields for recreation and of parts of recreation areas for occasional landings; but no such interchangeability of use is now recognized as practical.

Mention was made in the chapter on Ways of Communication (page 306) of the importance of making ample provision to meet the future needs of aviation by the development of airports and landing fields. These fields require certain physical features and means of approach by air, rail and highway which places a limit on the number of suitable sites available in the Region. Yet probably no metropolitan area in the world will need in the near future the equipment that the New York region will need in the matter of airports. The Region is at present, even with the facilities now being added, inadequately provided with landing fields to meet the almost certain requirements of the immediate future.

The aeronautics branch of the Department of Commerce listed, in January, 1929, about 1,330 airports in the United States of which 22 were in the New York region. It also stated that "there are of record more than 4,000 other fields in the United States on which landings may be made—owned by the states, municipalities, corporations, clubs, commissions and individuals. Many of these are constantly changing in character with the alternation of crops and for other reasons which make a permanent record of variable value."[1]

[1] U. S. Department of Commerce, *Aeronautics Bulletin No.* 5, January 1, 1929.

Of the 22 fields in the Region included in the 1,330, 14 are commercial, four military, two municipal and two auxiliary. Four of these (one military) are "equipped with beacon lights or partial or full equipment of flood lights for landing, flood-lighted buildings, boundary lights, danger lights, etc." Figuring on the basis of 16 civil fields (counting the Newark airport, which is now under operation, and the New York airport at Barren Island, which is under construction, and not counting the auxiliary fields) there is one for every 345 square miles in the Region.

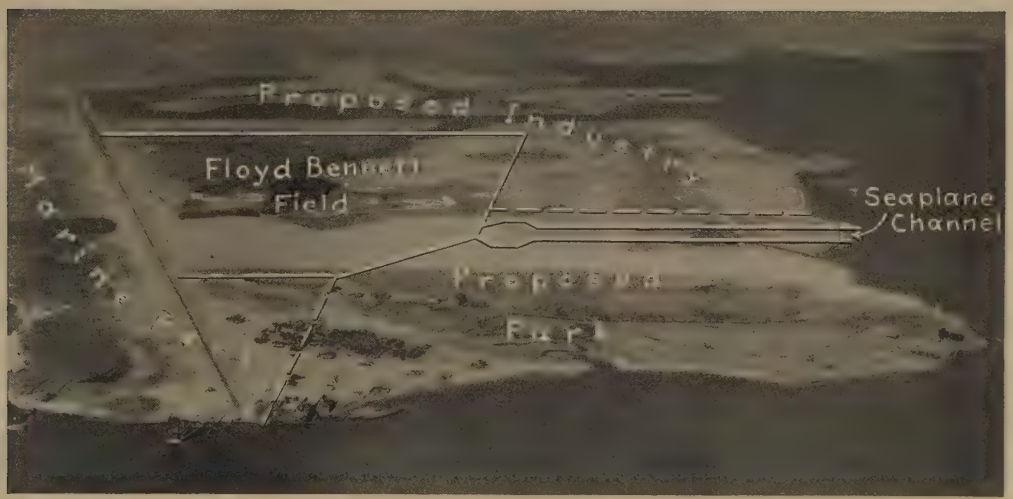


Photo by Fairchild Aerial Surveys, Inc.

FLOYD BENNETT FIELD, NEW YORK CITY'S AIRPORT IN THE BOROUGH OF BROOKLYN
The water area on the right is Jamaica Bay; that in the foreground, Rockaway Inlet. The highway on the left is Flatbush Avenue.

In the whole of Germany there is one civil airport for every 1,000 square miles and in the United States one for every 4,000 square miles.[1] On the basis of geographical distribution, the Region would appear to be provided with adequate landing fields, either made or in the making, to satisfy immediate demands. Obviously, however, population distribution throughout the country must be taken as a factor of vital importance in connection with the distribution of airports as of other terminal facilities. The New York region has one-tenth of the population of the United States and should therefore have a greater proportion of the aggregate number of fields. Even if it is assumed that the present 700 municipal and commercial airports in the United States are sufficient, it would probably not be unreasonable to have one-twentieth of this number, or 35 landing places, in the New York region. This would

[1] Paper by Major R. H. S. Mealing in *Journal of Town Planning Institute*, January, 1929.

be half of the number that should be provided if, as is not the case, the size of population were the sole determining factor.

Needs and Characteristics.—The uncertainties regarding the future of aviation, and the consequent difficulty of estimating future requirements make it impracticable to determine the precise number of spaces that should be allotted in advance for any

Photo by Fairchild Aerial Surveys, Inc.

MILLER FIELD, STATEN ISLAND

In the foreground appear facilities for taking care of seaplanes that use Lower New York Bay for landing or taking off.

given area or population. It is probable, however, that whatever provision is made, it will not be extravagant in proportion to the needs of the service. In the Regional Plan it is seen that 16 new sites are proposed for acquisition in addition to the 16 existing ones shown on the Atlas. If these fields are well planned and provided with good facilities for communication by land they may be sufficient. The purpose of limiting the number below what may be considered the optimum is to keep the program within practical limits of cost.

The proposed sites should be obtained without delay or else the communities within the Region will be faced either with enormous costs in removing buildings, as well as in increased land prices, or they will have to do without the facilities necessary to make New York an efficient center for air transport. New York is particularly adaptable for this form of transportation because of the large amount of water surface and adjacent level lands which would permit the building of airports under the most ideal circumstances for airplane and seaplane landings, although at considerable cost.

Before describing the proposals on the Graphic Plan, brief reference will be made to a few of the characteristics that should be possessed by sites selected for airports. In addition to the need of good approaches and means of access by highway and railway which have already been referred to as of primary importance,[1] the next most important needs in selecting sites are suitable topography and altitude of the land, nearness to the center of a community, correct orientation to the prevailing wind direction, freedom from obstructions of adjacent land and buildings, and unpolluted air.

The land should be level, and have a good cover of turf. If not naturally hard and well drained, it should be artificially made so. From 1,000 to 1,500 feet at sea level is necessary for runways; at higher altitudes longer runways are necessary. Planes head into the wind when landing or taking off so that the field should be oriented lengthwise along the prevailing wind direction. Locations having a minimum amount of fog and smoke are most desirable. Landing fields should never be placed where the prevailing wind blows from areas producing a large amount of smoke. The height of obstructions on adjacent land is an important factor in the size and safety of landing fields. The ratio of height of obstruction to distance from the edge of a landing area should be not greater than one to seven, which provides a safe gliding angle for airplanes. The lower diagram in Fig. 31 shows the building heights permissible on this basis up to a distance of 7,000 feet from a landing area. The upper diagram shows how far below the limiting line are the tops of the more important skyscrapers in the vicinity of the suggested landing field at Governors Island.

The general location of the units of a proposed airport system for the Region is given in Fig. 32. They are more definitely located on the Graphic Plan as part of the semi-public open spaces. With a more general use of airplanes than can be predicted at present, the numerous golf club grounds of the more central locations might, ultimately, be used for landing. Were it practicable to carry out a scheme of regional zoning that would insure permanent open development areas[2] this would make sites available when needed, and would thus make possible a better system of landing fields than could otherwise obtain.

[1] See pages 307 and 366.

[2] See page 383.

From the point of view of air transportation the relative usefulness of the existing fields should be determined according to the method of rating established by the Department of Commerce, which is based upon their present development and equipment. As semi-public open spaces, however, the ownership, with present or intended use and without reference to equipment, is the deciding factor—whether the airport is fully developed or not and independent of its rating. Nearly all the fields shown as existing have some equipment. The emphasis is thus placed upon the acquisition of the sites rather than the development of the air terminals.

The landing areas, shown on the Graphic Plan are 46 in number, in different classifications. The proposals for new fields and seaplane landings are not intended to

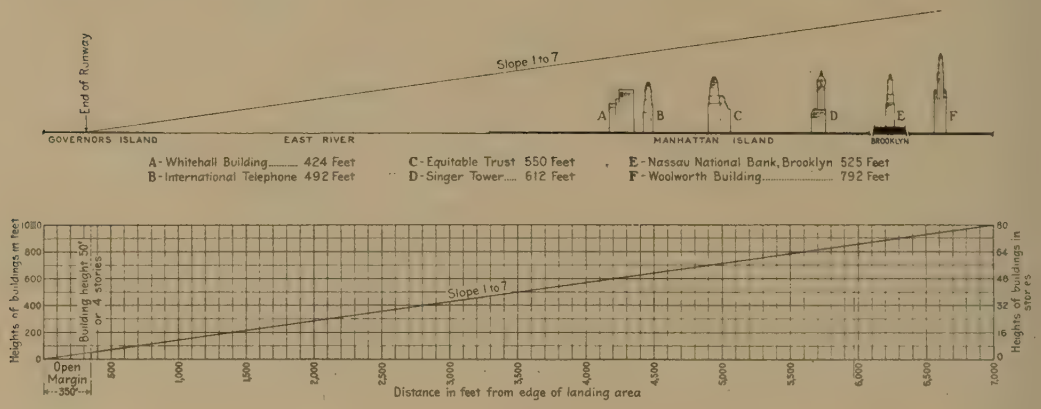


FIG. 31

GLIDING ANGLE FOR AIRPLANES AND ITS APPLICATION TO BUILDING HEIGHTS IN THE VICINITY OF LANDING FIELDS

cover all the possibilities for good landings, but they include the most desirable sites in the positions where open land is available. They have been selected and mapped as a basis for a comprehensive system of landing facilities. The numbers that appear on the general location map (Fig. 32) correspond to the numbers of the descriptive list on pages 374 and 375. Symbols on the location map distinguish the existing airplane landing fields from the proposed, but there is no attempt to separate the seaplane landings in this way. Where a seaplane landing exists, or is proposed in connection with an airplane landing, one number serves for both.

As in the case of the proposed park system, it is not necessarily implied on the one hand that more spaces will not be required, or on the other hand that all of the spaces proposed will be needed for air transport services by 1965. Flexibility of airport facilities for the metropolitan district is highly desirable because of the variability of weather conditions within the district.

When the fields are acquired the land surrounding them should be zoned in order that the approaches to the fields may be kept free of high buildings or any kind of obstructions that would render the use of the fields hazardous for both the fliers and the occupants of the land bordering the fields. Until these spaces are needed for air services they could be used for flying schools or as open spaces for various kinds of recreation. If an area is acquired for a landing field, and it later becomes undesirable for airplane use, the field could be converted into a permanent public open space.

Specific Proposals.—A brief discussion of a few of the proposed landings will be followed by a complete list of the units of the airport system.

Proposals Involving Special Considerations

The landing fields referred to below depend largely upon the expected realization of other proposals of the Graphic Regional Plan:

The district about Summit and Springfield (No. 8) is expected to become an important center of communication and population by reason of its position at the opening in the Watchung Mountain range. Following the lines of least resistance the various means of communication converge on this opening. Here the belt line railroad and metropolitan highway loop, also the radial transit and transportation facilities, come together. An airport is proposed on the outskirts of the area likely to undergo development as a result of the convergence of transportation facilities. In addition to serving the residential population, this landing field would provide useful facilities to those engaged in industry and commerce in the district.

North of *Caldwell* is an area suggested as an airport (No. 10). This field would afford local service to Caldwell but it could not be properly utilized as a regional airport unless and until the proposed Metropolitan Loop is constructed.

The most suitable land available for airplane landing nearest to the center of Manhattan is in the *Hackensack meadows* (No. 12). An area east of Secaucus at the curve of the Pennsylvania Railroad is suggested as a most desirable site.[1] It is one which can provide the character of facilities required near to the center of the metropolitan district.

One mile east of *Oradell* an airport (No. 14) is proposed to serve that part of Bergen County which is certain to have a great increase of population in the next decade.

Although civil use of military airports is not suggested as practical or desirable under average conditions, it is suggested that *Governors Island* (No. 19) should be assigned in part for such use because of its exceptional location adjacent to the heart of the City of New York. As a municipal airport it would be used by military planes and civil planes; in an emergency it could be readily turned over entirely to military use. Both airplanes and seaplanes can be provided for. It is the only adaptable site, with the possible exception of the Brooklyn Navy Yard, within near reach of southern Manhattan. The class of passenger and freight carried by air makes it desirable that the landing be as near as possible to the center of the city. The superiority of air over other forms of transportation depends on the time saved. As already pointed out, loss of time and general inconvenience at the terminals operate as a deterrent against the use of air transport. Governors Island, in addition to its proximity to southern Manhattan, has no expensive buildings erected upon it. It possesses a desirable degree of isolation

[1] Since this report was written a corporation has been formed to acquire and develop a large landing field at Secaucus.

from the crowded parts of the city, and yet is so near to Manhattan that no serious difficulty will be encountered because it is an island. The advantages of its location are clearly shown in the illustration on this page.

It is possible that in the future there will obtain a definite specialization of function in the use of the airplane that parallels the division of rail transportation into freight and passenger service. At least it might develop to the same extent that happens with water transportation. In either case it would be natural for a large center of population like New York City to provide and plan special fields to suit different kinds of service. In the event of a development of this nature the site afforded by Gov-

Photo by Aero Service Corp., Philadelphia, Pa.

VIEW OF THE UPPER BAY, INCLUDING GOVERNORS ISLAND
At the lower left is the "Los Angeles" of the U. S. Navy.

ernors Island would be a passenger terminal. As such it would be a magnificent air "portal" to New York City. It is hardly possible to find more imposing views than those from Governors Island which command a fine prospect of the towers of Manhattan and Brooklyn, of the Statue of Liberty and of the ships and boats in the Upper Bay.

The difficulty in getting airplane fields near to Manhattan, or of developing rapid means of land communication to suburban landing fields, points to the conclusion that New York can offer better facilities for seaplanes than for land planes. The fact that water landings can be obtained along *Manhattan shores of the Hudson River and the East River* may encourage seaplane use for long distance

FIG. 32

commuting and week-end pleasure trips. Proposals are also made for seaplane landings in the outlying parts of the Region at such summer week-end resorts as *Lake Hopatcong* and *Greenwood Lake*.

Location of Units of Airport System

The locations of the airports as listed on the following pages begin with the Atlantic Coast in New Jersey and extend in a clockwise direction around the Region.

1. Asbury Park.
2. Camp Vail, also seaplane facilities.
3. Keyport, also seaplane facilities.
4. Metuchen.*
5. Hadley Field, west of Metuchen.
6. New Dorp, Miller Field, also seaplane facilities.
7. Newark, also seaplane facilities.
8. Summit.*
9. Lake Hopatcong, seaplanes only.
10. Caldwell.*
11. Hackensack River, seaplanes only.
12. Hackensack meadows.*
13. Hasbrouck Heights, Teterboro Airport.
14. Oradell.*
15. Greenwood Lake, seaplanes only.
16. Cornwall-on-Hudson, seaplanes only.
17. Croton Point, seaplanes only.
18. Riverside Park, seaplanes only.[1]
19. Governors Island,* also seaplane facilities.
20. East River at 23d Street, Manhattan, seaplanes only.
21. Old Ferry Point,* also seaplane facilities.
22. Pelham Bay Park.*
23. Glen Island, seaplanes only.
24. Grassy Sprain Reservoir.*
25. New Rochelle.*
26. Rye Beach, seaplanes only.
27. Purchase.*
28. Eastview.*
29. Armonk.
30. Westport,* also seaplane facilities.
31. Danbury.
32. Central Queens Borough.*
33. College Point, seaplanes only.
34. Malba.*
35. Manhasset Bay, seaplanes only.
36. Brooklyn, Floyd Bennett Field, also seaplane facilities.
37. Rockaway, seaplanes only.
38. Jamaica Bay Islands.*
39. Garden City, Curtiss Field.[2]
40. Garden City, Roosevelt Field.[2]
41. Garden City, Mitchel Field.
42. Central Park, L. W. F. Engineer Corps.[3]
43. Central Park, Ace Flying Field.[3]

* Proposed airplane field.

[1] In June, 1929, a temporary permit was granted for a seaplane base at West 135th Street.

[2] On May 1, 1929, Curtiss and Roosevelt Fields at Garden City were consolidated under the control of Roosevelt Field, Inc., and a new Curtiss Field was opened at Valley Stream.

[3] Not in active use, 1928.

44. Farmingdale, Sperry's Field.
45. Port Jefferson, seaplane landing only.
46. Bayshore, seaplane landing only.

There is also a municipal airport east of Bridgeport just outside of the Region on Long Island Sound. It provides landing for both airplanes and seaplanes.

Open Military Reservations

Military reservations, like airplane landing fields, are "semi-public open spaces." They are also a distinct class and comprise forts, arsenals, training camps and other state or federal reservations in which most of the area is open space. Where, as in the case of the Brooklyn Navy Yard, they are predominantly used for buildings they are not included in the category of "open" reservations.

Military reservations have no value for public recreation other than to serve as open "lungs" in an area which, but for the presence of the reservation, would be built upon. They comprise public lands to which the public have little access. While one of their useful functions is in forming a fairly permanent break in crowded building growth, they may be objectionable in that they constitute barriers to ways of communication. An outstanding example of the latter in the Region is the interruption caused by the reservation at West Point to the traffic leading to the Storm King Highway. The growth of military aviation and the increasing need for aerodromes for military use are likely to have considerable effect on the selection of areas for military reservations in the future.

Areas Adaptable for Private Estates, Forests and Cultivation[1]

The various private, public and semi-public land uses that have so far been described, added to those that are incidental to the provision of ways of communication, may be said to cover all the uses that are generally considered in connection with the planning and development of a metropolitan area. As already stated, the land needed or likely to be needed for close development in the next forty years amounts to only about one-fourth of the total area of the Region.

The remaining three-fourths of the land necessarily comes within the category of open development, and a great part is land that is incapable of being, or is unlikely to be, developed for anything but its present primary uses. Its high degree of openness is the result, mainly, of its low degree of accessibility to the populous centers, or of its mountainous or marshy character. Much of it is wild land, but it also includes extensive areas of fertile land used or suitable for intensive farming. Part of it is used for large private estates, in which wild, pastoral and arable land are combined, and where wealthy residents and institutions have chosen localities that possess some degree of isolation from the closely developed areas. Some of it is forest and

[1] For discussion of problems connected with reservation of cultivated land in urban areas see Regional Survey, Volume VII.

will remain forest—with perhaps increasing appreciation on the part of the authorities of the commercial value of properly cultivated timber. Increasing areas will be improved by wealthy residents of the Region seeking country places. Farming will continue on the more fertile land, and, if and when prices of food rise, may be carried on more profitably than at present.

In making proposals for the future development of these extensive open areas, it is necessary to abandon the making of more or less special recommendations and to speak in general terms about the manner in which areas that are likely to remain open should be treated. This will involve a brief discussion of certain principles respecting planning by private as well as public agencies. But general though the next pages must be, they contain suggestions which are considered to be as important as any others that the staff of the Regional Plan has to offer.

The assumptions that all suburban land, however accessible to means of transit and however expensive its development for building purposes, should be divided into small lots, and that subdivision, however occurring, is a sign of progress and prosperity, have been shown in the regional survey to be fallacious.[1] The need of restraining wasteful subdivision and at the same time of reserving and stabilizing land for open uses, where it is best suited for these uses, is of urgent importance in the interest of general welfare.

What follows is a presentation of arguments and considerations that should lead to economically sound and stable conditions in those outlying parts of the Region that are not now required for close development, and to the realization of economic and social values that are obtainable only where growth takes place over long periods of time without radical disturbance or unnecessary change.

Open Areas not Classified.—If it were possible to define the boundaries of the land that should be reserved for farming or afforestation in the more rural parts of the Region, much valuable guidance could thereby be given to public authorities and owners. This has actually been done to a limited extent in the proposals contained in the Plan for extension of park areas, some of which will be in the nature of forests providing both for cultivation of timber and for certain recreational needs. Otherwise no attempt has been made to classify and place on the map the areas that are best adapted for different kinds of cultivation. Such areas could not be zoned for open uses under the law as it stands, nor is there likelihood of any public demand arising in the near future for the amendments of the law that will be necessary for this purpose.

As conditions now are, owners of property would never agree to any allocation or zoning of land to definite open uses, however well conceived and scientific the methods of making such allocation might be. If, however, in course of time, changes occur in public sentiment, it may prove to be practicable to extend zoning laws so as

[1] See Regional Survey: Volume VII, Monograph Three, Part I; also, Volume II (Land Values Report), pages 170–176.

to permit land to be restricted to open development. Then it will become of importance for towns and villages to include provisions for such zoning in their plans.[1] Therefore, although the Regional Plan is being presented with the idea of showing what should be done, and not merely what can be done, under the present law, it has not been considered necessary at this stage to suggest definite areas for all open uses. The Plan is limited to showing the large open areas in one general classification, based on its present use, with the exception already referred to, namely, the proposed areas shown for extension of public parks and reservations.

Although not designating the actual areas that are adaptable for different kinds of private estates, afforestation or farming, it is desirable to supplement what has already been said in the regional survey[2] regarding the advantages to be obtained by reserving land definitely for such open uses. These advantages would accrue both to owners of property and to the communities. The stabilization of the existing uses and the fact that this should and could be accompanied by relief of taxation would be beneficial to the owners. On the other hand, public expenditures could be adjusted to the comparatively permanent open use and it would be unnecessary and undesirable for the public authority to tax such land on a prospective building use that would not exist. The desired stability of use and relief of taxation could be secured at present only by mutual agreement between towns or villages and property owners.

Adaptability of Areas for Country Estates.—An example of the kind of area that should be reserved for country estates is that known as the Wheatley Hills section of Nassau County, Long Island. This area is not discussed as an outstanding example but only as an example of general principle. Its conditions and requirements are typical of those in several parts of the Region. Reference has already been made, in the description of parks, parkways and boulevards,[3] to the fact that no proposals have been included for large parks or parkways in this section of Long Island. It is now used for large country estates and this is believed to be the best use to which it can be put from the points of view of the economic development of the land and the advantage to the public. This hilly land in the north of Long Island is peculiarly adaptable for large residential properties forming what are practically private parks. Large parts of it are too inaccessible for close residence.

The large private estates in this district, which provide all the amenities of closed parks, constitute a kind of open area that is useful to those living in other more populous districts of Long Island. These private open lands are intersected by roads and are within driving distance of areas that are closely developed. Although the estates themselves are not open to the public, they nevertheless provide park-like environment to the drives along the country roads, and the passer-by enjoys the

[1] See discussion of open-development zoning, Regional Survey, Volume VII.

[2] Regional Survey, Volume VII.

[3] See description of parkway and boulevard routes Nos. 24 and 25, page 281.

natural beauties which their owners have preserved or created. Thus, much of the benefit that the public obtains from large parks and parkways is secured in this district without the cost of public acquisition and maintenance. If close development were forced into this area, the stability of the residential ownership of these private park-like properties would be destroyed. The result would be a public misfortune.

What the owners desire is not, in itself, a reason for advocating the continuance

Courtesy, County Engineer, Nassau County *Photo by Air Map Corporation*

A PORTION OF THE MOST CLOSELY DEVELOPED PART OF THE WHEATLEY HILLS SECTION OF LONG ISLAND

of the present use, or of omitting parks and parkways. The guiding consideration is that the average community needs more open spaces than it is likely to purchase for public parks, and that, in addition to land acquired by the public, the best form in which space can be kept open is in large estates maintained at private expense. This, of course, will be true only so long as the preservation of natural beauty and spacious landscapes is a leading motive in the private ownership. When this motive is present, it is desirable that large residential and cultivated estates should be conserved as near to a great city as is practicable, so long as they do not become

a barrier to a normal system of circulation and do not occupy lands that are urgently needed for close residence.

The beauty of such places is a matter of time. They become more and more beautiful from generation to generation, and ultimately, if and when truly ripe and lovely, often are opened to the public. It is not unlikely that in the future communities will take more interest than they now do in preserving features of historic interest and natural beauty. If wealthy citizens incline to use their money in developing and preserving the natural landscape, they are creating for the Region and for the nation something that may be as valuable from a cultural point of view as any collection of works of art. The initiative and first cost incurred in assembling or preserving the works of nature or of art come, in probably the majority of cases, from the incentive of private interest or ambition. Later what has been done to gratify a private appetite may become a possession of the public that could not have been obtained without enormous cost by community effort. Many of the most beautiful parks in Europe were privately designed and created and later dedicated to public use. Thus the preservation of these estates not only gives some collateral advantages, without cost, to the public while they are privately owned, but may be the only way to secure public places of real beauty for future generations.

The available land for close development in more accessible parts of the Island, as in the Region as a whole, is much more than is needed for the next forty years. Ample park areas are proposed for those parts of Long Island which are most accessible to the existing communities and to the areas most likely to be used for close development in future. The central and southern parts of the Island furnish opportunities for developing a widely varied and beautiful system of parks and athletic fields, as proposed in the Graphic Plan. The hill sections of the center of the Island provide for one type of use, whereas the warm waters of the South Shore provide for another type. The South Shore has a wider beach, more accessible from the inland than that on the North Shore. Public parks should be provided near to the populous centers. Where it is desirable to supplement the nearby local parks with more distant country parks, the areas chosen for the latter should be in accessible localities that have not been expensively developed as private estates.

Transition from Large to Small Estates.—Perhaps in the future the pressure of population will make it reasonable, and in keeping with sound economy, for a somewhat less open type of development than now exists to take place in the area occupied by large estates in the northern part of Long Island. But with the exception of a few spots near railroad stations, the first and possibly the final step in any transitional process will be in the conversion of the large into small acreage properties.

In addition to the reasons mentioned there are important hygienic and economic reasons for maintaining considerable parts of Long Island in acreage. It appears likely that Nassau and Suffolk counties will have to depend on the resources of their

own areas for their water supply. The preservation of the purity of the percolating waters of these two counties is essential, and if close development is permitted to spread itself indiscriminately, and to continue as at present to load the land with impurities, a very serious situation will arise in which public health will be menaced. Improvements of methods of sewage disposal may help to prevent this menace, but the heavy expense of making these improvements and of obtaining a supply of water for a large urban population will make it less profitable in many places to subdivide land in small lots than to keep it in small estates. Therefore it is desirable, as pointed out in the report on water supply in the regional survey, that parts of Long Island should be zoned for comparatively large residential estates or for farms.[1]

Other Areas Suitable for Open Development.—The foregoing statement regarding certain features of land utilization in northern Long Island relates to an area on the borders of, if not within, the urban influence of New York City. Other areas within the 15- to 30-mile radius from the center of Manhattan have the same characteristics in varied degree and are subject to the same considerations. A glance at the Graphic Plan Atlas shows that any impracticability of keeping such reservations does not arise beyond the 15-mile radius, and even in sections between the 10- and 15-mile radius, from any sparsity of land. Most of the building in the environs has taken place along strips or corridors of various widths—following the lines of railroads, transit lines and major highways. Between these strips large areas are still in primary use or are held as waste lands without any immediate prospect of being wanted for building. (See Fig. 33.) Although the advantage of keeping open cultivated areas between the urban wedges that extend outward from the compact city is even greater than that of reserving such areas in more remote parts of the Region, it is obvious that the difficulties of keeping land "open" increase with nearness to the center of the Region. In Suffolk and the upper parts of Westchester, New York State, in Fairfield, Connecticut, and in all the New Jersey counties outside of Hudson and Essex, it is more feasible to maintain large estates and farms than in the inner counties.[2]

From the points of view of the public welfare and of values of property, the planning and zoning of these open areas in county, town and village plans is just as important as the planning of urban land. It appears obvious as a general principle that if all the land that is required for building could be selected where it could be most economically developed in relation to topography and means of communication, the combined public and private advantages would be enormous. What is not obvious is how anything can be done to obtain even a partial application of this principle, which would carry with it the implication that much private land would be left for private estates, agriculture or other open uses.

[1] Regional Survey, Volume VIII, page 41. See also discussion of open-development zoning, Regional Survey, Volume VII.
[2] See statement regarding existing farm lands in the Region, Regional Survey, Volume VII, Monograph Three.

OPEN DEVELOPMENT AREAS

In the discussion of this subject in Volume VII of the survey it is suggested that most people are unable to comprehend the need or practicability of preserving and maintaining areas for private estates or cultivation in the outskirts of cities and villages. Even if the public and the owners of property became convinced of the

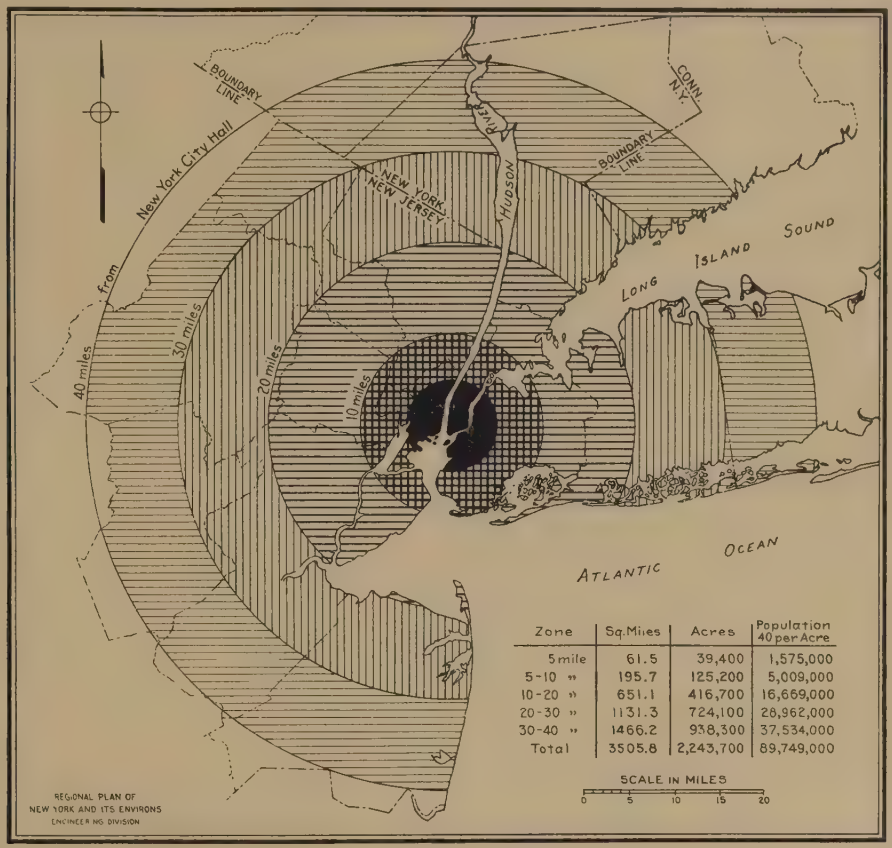

BOUNDARY LINE
New York City Hall
from
40 miles
30 miles
20 miles
10 miles
NEW YORK
NEW JERSEY
HUDSON
CONN.
N.Y.
BOUNDARY LINE
LONG ISLAND SOUND
ATLANTIC OCEAN
Zone | Sq. Miles | Acres | Population 40 per Acre
5 mile | 61.5 | 39,400 | 1,575,000
5-10 " | 195.7 | 125,200 | 5,009,000
10-20 " | 651.1 | 416,700 | 16,669,000
20-30 " | 1131.3 | 724,100 | 28,962,000
30-40 " | 1466.2 | 938,300 | 37,534,000
Total | 3505.8 | 2,243,700 | 89,749,000
SCALE IN MILES
0 5 10 15 20
REGIONAL PLAN OF NEW YORK AND ITS ENVIRONS
ENGINEERING DIVISION

FIG. 33

DIAGRAM SHOWING THE GREAT INCREASES IN LAND AREA AS THE CITY EXPANDS OUTWARD

The inner circle shows the land area within a radius of five miles of New York City Hall. The increments in area—and in population that could be accommodated at an assumed density of 40 persons per acre—are shown for increasing lengths of radius; they indicate the great extent of available land within the outer rings as compared with that in the inner areas.

desirability of making such reservations in the environs of New York they would still feel that it would not be practicable to make them because of the system of assessing and taxing land on the basis of its full market value for any use to which it may be put in future.

Adjustment of Assessment to Open Uses.—Assessments can be adjusted under the prevailing system to an "open" use value where this use is permanent and no higher use is permitted or is probable. Every municipality exempts certain private lands from taxation—such as cemeteries, church sites and other property used for charitable or religious purposes. This power might be extended to give partial exemption to certain other types of property, if this were clearly desirable in the interest of general welfare.

Where a farm exists in a country district so remote from an urban area that there is no prospect of demand for the land for building, it is assessed on its agricultural value. Where land is in or near an urban area and is restricted by zoning, the assessment may be adjusted to the value which can accrue under the zoning restrictions. There are practical difficulties, however, confronting the assessor in giving an owner any advantage in lower assessments because of such restrictions. The fact that the restrictions are not permanent and may be changed by the local authority as a result of the demand of the owner, means that a much higher value may accrue if and when changes are made. If, however, zoning could be made more permanent, it should be possible to secure less intensive use of land and even the reservation of areas for private open spaces such as golf courses, and for cultivation, with financial advantage to owners, as a result of the saving that would obtain in taxation over a considerable number of years.

In the New York region rapid urban growth is the rule rather than the exception. With such growth taking place and with the natural tendency of even the smallest communities to maintain their assessments of land as high as reasonably practicable, there would be great difficulties to be overcome if it were decided to attempt the zoning of land for agricultural purposes. The attitude of these communities to such a proposal may be inferred from their present attitude of opposition toward the setting apart of land for public parks and other reservations which exempt them from taxation.

To zone land for agriculture or afforestation, and to assess it as such, would not be to exempt it completely, but would be to exempt it only to the extent of not assessing and taxing it as prospective building land. Where such land was not likely to be required for building and where it was most adaptable for cultivation it should be exempted to this partial extent and the authorities would lose nothing as a result of the limitation. So far as the public authority is concerned, therefore, it might be practicable on the basis of a plan—and a plan in such a case would be essential—to evolve a scheme of zoning areas in part for cultivation and in part for building.

Having overcome the difficulties of the authorities, there would remain the difficulties of inducing owners to accept the conditions that the authorities would have to lay down. Whereas the owner might be content to agree to set his land

apart for cultivation for a period, this would not be complying with the conditions necessary to obtain an assessment on the existing use. To satisfy the authority, he would have to agree to a permanent restriction on use. Few private owners, however, would be prepared to admit that their land was less likely to be required for building than that of other owners, even if a careful survey revealed that it was less adaptable for building than the other land.

Zoning of Open Places Under Eminent Domain.—The importance of preserving permanent open places, in addition to public parks, between urban communities, is discussed by Mr. Edward M. Bassett in Volume VII of the regional survey,[1] and leads him to present a suggestion as to how spaces might be kept free from buildings by means of eminent domain. He suggests that those lands in private ownership which are adaptable and desirable for maintenance as permanent open development areas could be so maintained by acquisition of a public easement limiting structures to 3 per cent building coverage of the lot.

In taking such a public easement by eminent domain, the municipality would have to award the owner the difference between the fair value before the taking of the easement and the fair value after the taking of the easement. To impress these areas with such a public easement would not result in preventing their use for residence, business or industry, but would merely limit the building to a 3 per cent coverage. This method might be used in connection with the prevention of structures around the margins of aviation fields. Difficulties in carrying it out would probably arise because of the demands of realty owners for high awards, owing to the prevailing optimism regarding the prospective building value of even inaccessible land in urban regions. Mr. Bassett says it would not be practicable under existing conditions to zone land permanently for such a small degree of coverage as 3 per cent.

Purchase of Land with Intent to Keep in Open Use.—The most hopeful methods of obtaining permanent reservation of areas for agricultural uses lie either in the acquisition by development corporations of areas for new towns in which an agricultural belt is reserved[2] as an essential part of the scheme or in the acquisition of agricultural land by public authorities with a definite purpose of keeping it free from building. The power now possessed by public authorities to acquire land for parks probably could be enlarged to include a power to acquire land for cultivation.

Municipal corporations may purchase, hold, lease or otherwise acquire for use of a city or county necessary real property for city or county uses or purposes.[3] To acquire land for "lung" space and to use it for farms might not be regarded by the courts as legitimate county or city uses and purposes, but it could be made

[1] Regional Survey, Volume VII, Monograph Three.

[2] See statement on self-contained communities in Regional Survey, Volume VII.

[3] Laws of New York State: County Law Sec. 12, Sub. 13; General City Law Sec. 20, Sub. 2.

legitimate by state enactment. On this subject Mr. Edward M. Bassett makes the following statement in reference to New York State:[1]

"The courts of this state have declared that condemnation could not be employed to take more land than was needed for a street or park because the excess was not taken for a public use—or at least the courts considered that the taking of such excess for making better building plots, or for selling subject to restrictions, or for leasing, was not a public purpose. Consequently, the excess condemnation amendment to the state constitution was adopted. There would never have been any need for the constitutional amendment if the taking of the excess could be shown to be a public use.

"There is not, however, at present any statute under which counties and cities could acquire reservations for 'lung' space by eminent domain. But areas for water supply or for the prevention of pollution of water supply can be acquired under existing statutes.

"If the proposed 'lung' space were taken for a park, there would be no need of any new statute. But it would not be wise to do this because parks cannot be used for anything but recreation purposes, and a lease of park space to a farmer for agricultural purposes would be voidable. The right way to proceed would be to prepare a statute or statutes, declaring that the purchase or acquisition of 'lung' space was a public use, setting forth that the main need was to keep the land free from ordinary residential, business or manufacturing use, permitting it, however, to be used for agriculture, stock raising or dairying purposes."

Some Reasons for Keeping Private Open Areas.—Even if the practical difficulties could be overcome, why should areas be reserved for cultivation within the environs of cities? One of the most important reasons is that the reservation of more open land in the metropolitan area would break up building masses into economically desirable units. It would bring the city and country into frequent juxtaposition—with advantage to both. The absence of balance in the growth of the modern city, and the presence of congestion are due, in large measure, to the lack of sufficient open land in its built-up areas.

The present efforts of cities and villages within the New York region to acquire land as "lung" space is limited, for financial reasons, to the acquisition of land for pleasure parks, athletic fields and playgrounds. A community that has such open spaces on the standard of one acre to every 300 inhabitants and is likely to maintain this standard permanently may claim that it has an adequate amount of public space for all recreation purposes. In exceptional cases sufficient foresight has been exercised by communities to enable them to say that they have ample public parks and playgrounds in accordance with this standard.

It would be beneficial, rather than otherwise, however, if parts of the public spaces were used for farming or systematic afforestation, since for the limited purposes of active recreation and pleasure parks one acre of public space to 400 persons is sufficient. Where the open area is merely required for "lung" space or where the enjoyment it gives is merely that of sight-seeing, open land would be equally attractive were it to consist to a large extent of woods where the land is best adapted for grow-

[1] Letter of April 8th, 1929.

ing timber, cultivated fields where the land is fertile but not needed for active recreation, and waste land comprising rocky hills, ravines or coastal marshes suitable for reclamation. The acquisition and allocation of land for these purposes by the more rural counties would mean that when population increased they would have ample scope for selection of areas for extension of public parks.

Advantages of Public Acquisition of Land for Forest and Cultivation.—The financial difficulty which faces communities, in acquiring land for parks, is perhaps less that of being able to find money to purchase the land than it is of facing both the cost

Photo by Fairchild Aerial Surveys, Inc.

WOODED AREAS IN THE RAMAPO MOUNTAINS

View looking north across Hohokus Township in Passaic County, with the Ramapo River in the foreground. The hills in back of the river are proposed as part of a public reservation.

of maintaining the park after it is bought, and the loss of revenue due to the land being exempt from taxation. In any case the two latter items may be considerable in any budget of park acquisition.

This being so, there would appear to be great advantages from a financial point of view in having public authorities acquire land which would not cost anything for maintenance, and yet was maintained; and which yielded at least as much revenue to the city as it would yield under private ownership. That is the case for the economy of acquiring some land to be held as cultivated open space as against

acquiring unnecessarily large areas for public parks which involve heavy expenses for maintenance.

The development of forests presents fewer difficulties than the other kinds of cultivated areas in matters of administration and maintenance. Forest areas are more easily managed and controlled than farm land, and therefore present fewer problems in connection with public management. The development and maintenance of the forests would improve their quality as features of scenic beauty. It is probable that forest cultivation might not produce direct financial gain to the communities, but any loss would be more than counterbalanced by the indirect advantages.

Some parts of the river valleys in Fairfield County, Connecticut, and in the more distant counties of New Jersey, are peculiarly suitable for growing timber. They also include areas of level land that are, or could be, used for ordinary cultivation. Both kinds of land should be acquired in these valleys to round out any scheme of land reservation for public purposes. This would result in preserving country of great natural beauty within easy reach of the most populated areas in the Region.

Assuming that it would be a legitimate public use for a public authority to own and rent land for farming, there would still remain the question whether the rents obtainable from such land would be as much as the authority would normally obtain in taxes from a farmer operating under private ownership. Obviously the answer to this question would depend chiefly on whether the management under the public authorities was efficient or otherwise. With good management, lands acquired at a reasonable price could surely yield in rent a greater amount than could be collected by a public authority in taxes from the same land in private ownership. Public acquisition of land should be resorted to only where it is necessary or desirable for the public welfare, and any scheme of public reservation should be based on comprehensive county and town plans.

The Problem in the Inner Part of the Region.—In those parts of the Region that are close to the urban centers the absence of any systematic arrangement of open space in the past, and the fact that building development has proceeded indiscriminately and in widely scattered forms over large areas, mean that the greater part of the land has already become urbanized, although largely unbuilt upon. Because of the extent to which land has been subdivided into lots only small parcels are available for cultivation near to the close developed areas. Such land as is still in acreage in the suburban parts of Westchester and Nassau Counties and parts of Richmond has already acquired by sale, speculation and assessment a value which makes it too expensive to acquire for profitable cultivation. Nevertheless some of this land, especially where it requires expensive drainage or reclamation, might be more profitably used for such purposes as nurseries and commercial recreation than for building development.

Opportunities are still available in the boroughs of Queens and Richmond for reserving areas that are suitable for cultivation and are comparatively isolated from

means of transit. As, however, the needs of the potential population of these two boroughs, in the matter of recreation space, are such that the cost of acquiring park space will probably be as much as the city can reasonably afford, there is little prospect of any open areas being acquired within the city in addition to those needed for pleasure parks and active recreation. In other words, all that the Regional Plan can contemplate as practicable within the City of New York is the extension of the areas for recreation, sufficient to meet the needs of the population on an average of one acre to 300 or 400 persons.

Incidentally it may be pointed out that there are opportunities, within the city, to encourage comparatively open development of some suburban sections which are shown on the Plan as adaptable for close development. If, by a process of zoning, these sections can be limited in density to a point that will enable comparatively wealthy residents to have large gardens attached to their homes, much of the benefit that would come from the reservation of lands for public parks or commercial cultivation will thereby be obtained. For instance, a neighborhood which consisted of houses occupying from one-half of an acre to an acre of land would practically form a private park with scattered buildings. Those who could afford to live in these houses would probably maintain their gardens in such a way that the park-like effect of the development would make it as pleasant as many public open spaces. This is the form in which spaciousness can be obtained most easily in the suburbs of the city. It has the pre-eminent advantage of contributing to the general amenity and at the same time providing the kind of land development that produces the highest tax revenues to the community.

Expensive residences erected in the city are an indication that the city is able to retain those who are the greatest contributors to its tax revenues, its charities and its social activities. If these citizens could be kept in the city, instead of being made or encouraged to drift outside, much financial loss to the city would be avoided.

Open Forms of Close Development.—In the country areas outside the city and beyond the most urbanized parts of New Jersey, much residential growth has taken place, which is neither strictly open nor close development. It may be described as an open form of close development. This growth has gained in momentum in recent years since railroad and transit facilities have been improved and the motor car has become a common form of transportation. It takes two prominent forms, based on public demands:

(1) The erection of houses for well-to-do people on plots of an acre or more in the most attractive country neighborhoods in Nassau and Westchester Counties, in New York State, and in the Counties of Essex and Union in New Jersey.

(2) The subdivision of country estates into small lots for erection of small houses, which have been promoted, in the main, by those interested in land speculation.

The large number of persons who create the first of these demands have erected or are now erecting comparatively expensive homes in the more attractive suburban districts. They may be regarded as having their needs amply met and as being responsible for a most desirable form of development. This group has been largely instrumental in promoting public park and parkway systems throughout the counties in the environs. These parks and parkways are in turn becoming new magnets in drawing well-to-do people away from the central districts. There is probably no region that possesses more extensive or more attractive residential neighborhoods for well-to-do people than exist in the environs of New York, on all sides of the city.

On the other hand provision is being made to meet the second of the demands on a scale far in excess of needs—which in itself is an evil. It is being met, too, in very undesirable forms. As is pointed out in Survey Volume VII, the extensive subdivision of areas that are ill adapted for residence, that are not provided with water supply, sewerage or other local improvements, and that lead to wasteful and disorderly spreading of houses, is one of the primary causes of the worst evils in city growth. Such developments are not only unwholesome and uneconomic but impose heavy burdens of cost upon communities.

Unfortunately it is those who are in the poorest circumstances that have to meet the high costs of speculation in defective subdivisions. It is they who drift into places where land is sold at the lowest price and yet is dearest to the buyer, because of natural defects and lack of access and local improvements. Naturally the cheapest land is that which is in the most inaccessible positions and has had the least money spent on developing it. The purchase of such land by small investors on the instalment system has been carried out to such an extent that large areas of land, which are quite unsuitable for close development, have been withdrawn from use for cultivation and private estates, to the great injury of the communities. It would be far better in the interests of owners of land, on the whole, if much smaller areas of land in accessible positions were subdivided and compact urban growth were encouraged, with reservations of cultivated land in between them. Nassau, Suffolk and Bergen Counties have suffered in an exceptional degree from forced subdivision in recent years.

Private Estates Profitable Form of Land Use.—There is an erroneous impression that the subdivision and sale of land into small building lots, however premature, is more profitable to communities than its reservation for private estates or cultivation. It is nearer the truth to say that no kind of development imposes greater burdens on a municipality than that which causes scattered houses to be built on land that is difficult to drain and has no public services provided at the expense of the developer in advance of building. On the contrary, the owners of large estates and spacious residential properties, who require few or no streets, sewers or parks, and whose educational needs are comparatively small, probably contribute more in taxes in

proportion to the benefits they obtain from the community, than any other class of owners. It should be no part of the policy of any city or town to burden these estates with excessive taxation, or to do anything that will discourage their owners from maintaining them, with the professed object of developing the country districts for the benefit of large numbers desiring inexpensive homes on small lots, but with the actual result of promoting wasteful speculation.

Speculative subdivision of land in remote country areas is financially injurious to the properties that are developed for good residences and private estates, as well as to the purchasers of small lots in the subdivisions. Part of the burden which the community has to bear in providing local improvements for such developments, with their scattered buildings requiring very expensive services, has to be met by the owners of property who have provided all their own services. While the greater part of the loss and waste which is due to forced and premature subdivision has to be paid for by the poorest members of the community, it is natural that the administrative authorities place as much as possible of the loss and waste on the shoulders of the most wealthy residents. The result is a growing friction in suburban communities because of the wasteful excess and inequality of tax burdens.

As already stated, this matter has been discussed in Survey Volume VII, and is here referred to as a hindrance to the reservation of land that is most adaptable for recreation and agriculture, and least adaptable for economic building development. As soon as land is subdivided, it becomes subject to assessment as building land. When it is sold by auction to those interested in land speculation, prices and assessments are increased although the effect of the subdivision may be to diminish actual values. Land that is prematurely subdivided is not only wrongly used, but all the land that is rightly used in a city, village or town has to pay part of the cost due to wrong use. No scheme for reserving land for either parks or forests or for promoting desirable private forms of open use will be fully successful without being part of the scheme for controlling new subdivisions.

Planning Unincorporated Areas.[1]—Most of the land which has been referred to in this description of the best use of country areas in the Region, lies in the unincorporated parts of counties, called towns in New York State. The problems of securing better forms of open development, and of preventing the continued sterilization of land that follows unwise subdivision, will not be adequately faced until more planning is done in these unincorporated areas. The towns in New York State have the same powers to make plans for their areas as cities and villages. Connecticut towns have also considerable planning powers. The use and extension of these powers by New York and Connecticut towns, and the expansion and use of the planning law in townships in the state of New Jersey are needed to secure proper appreciation and the ultimate solution of the problems of open development.

[1] See description of planning powers of incorporated and unincorporated areas in Regional Survey, Volume II, page 214.

Within recent years the laws with respect to town planning and town zoning have been so materially improved in New York State that there is no such compelling reason for incorporation as previously existed in that state. By taking advantage of the new legislation, town authorities may meet all the requirements, in the matter of zoning and planning, of those parts of their areas which are urban or likely to become urban in character.

Planning is needed as much in the counties that are predominantly agricultural as in those that are becoming predominantly urban. This will become particularly necessary if and when any extension of zoning powers is granted to the authorities in unincorporated areas, to enable them to promote permanent reservations of open land without public purchase. The counties that are nearest and most accessible to the central areas of New York City have attracted large populations and have grown enormously in wealth. As a result of their wealth, they are able to acquire extensive areas for parks and parkways.

In the more distant counties, such as Suffolk, Middlesex and Monmouth, population and wealth have not increased sufficiently to justify such large expenditures on the acquisition of public parks and parkways as in the more populous counties, however much this acquisition may be desirable for the encouragement of future residential growth. But these outlying counties have the advantage of low-priced land as compared with the inner counties that have more rapid growth. Moreover, the land in the outlying counties is more fertile and generally more adaptable for cultivation. It is in the counties with comparatively slow urban growth and low land values that it is most feasible and desirable from a physical point of view to reserve land permanently for forest and agriculture. It is they who would benefit most from changes in the law that would permit or encourage this kind of reservation to be made.

Local town planning activity in the outlying counties can make no better beginning than by considering the relation of the locality to the center of the Region, that is, by adopting and adapting the proposals of a regional plan. These proposals are of necessity only the larger considerations, such as the main highways, the large parks or reservations, and the inter-sectional parkways. Although the agency that will carry out these projects will be county, state, interstate or even national, it is especially helpful if the local planning group endorse the undertakings and possibly make suggestions that will fit the plans to local conditions, if such can be done without seriously impairing the major plan. It sometimes happens that regional interest and immediate local interest seem to conflict to some extent, but a closer scrutiny usually discovers that for a long period of time the local interest is also best served by the regional scheme. For example, in the establishment of a large park which formed, say, a considerable part of a town or township, the loss in taxes would ordinarily be made up and doubled or tripled by the increase of land values due to improved roads and transit facilities, provided because of the park.

Areas of Water and Treatment of Their Shores

Water Areas as Open Spaces

That part of the Region which lies in New York State includes the three large islands of Manhattan, Long Island and Staten Island; its mainland section has very extensive frontages on Long Island Sound and both shores of the Hudson River. The New Jersey part of the Region has no large islands, but extensive frontages on the ocean, and on bays and rivers. The unique extent and distribution of the water areas that abut or lie within the Region has been referred to in the statements of proposals regarding waterways and industries, which show that there is ample waterfront land to meet all demands likely to be made in the future for the combined uses of industry, commerce, residence and recreation. The waterfront areas shown in this plan as adaptable for these uses are described in the preceding summaries.[1] Brief reference will be made here to the importance of the water areas themselves, in giving a high degree of openness and natural attractiveness to the Region. The length of their frontages is 1,800 miles, with extensive stretches having beautiful prospects over ocean and river.

In a sense it may be said that the water areas are natural obstructions that cause congestion of the central areas; but in another sense they may be claimed to be the justification of this congestion for they form zones of open water surface all around the congested areas. Manhattan, for instance, has only one acre of park to every 1,386 persons,[2] but its island character and narrow width give it the benefit of the open spaces contained in the wide expanses of the Hudson and East Rivers. In a lesser degree, other parts of the Region are penetrated by sounds, inlets and rivers so that enormous areas that would be overbuilt under ordinary conditions, have an open prospect which largely counteracts the effect of the overbuilding.

As pointed out in different parts of the regional survey, one of the greatest problems in the metropolitan area is that of removing or lessening the pollution of the water areas. This applies both to the tidal waters and the inland rivers. Until this is done the recreational value of the waters and waterfronts cannot be obtained. There is nothing inherent in the process of commercial development of the waterfronts which prevents full advantage being obtained of their recreational opportunities.

It is unnecessary to present any comprehensive proposals on the Plan for treatment of water areas other than those which have to do with the reservation of the inland bays of Long Island and the parkways along the river valleys. New water areas are shown on the Graphic Plan in connection with the following two projects: A straightening of the Hackensack River and the construction of the Chimney Rock Reservoir north of Somerville and Bound Brook. The first is more important as a

[1] See pages 322–356.

[2] Regional Survey, Volume V, page 39.

channel of transportation than as an open space. The reservoir forms a feature of the park system and also a unit in the water supply system of the Region.

Preservation of Beaches

Inasmuch as the Region has such extensive ocean frontage the question of shore and beach preservation is of exceptional importance. The separate proposals relating to land uses indicate the character of the development that is thought best for the waterfront areas. It is apparent, however, that, incidental to the type of development that may take place along the ocean frontages, specific plans must be adopted

Courtesy, Consulting Engineer, Borough of Brooklyn

A SUNDAY AFTERNOON ON THE BOARDWALK AT CONEY ISLAND
The usefulness of this beach is seriously threatened by the increasing pollution of the waters in New York Harbor.

for protecting shores and beaches. The making of these specific projects will be a matter for each municipal authority within whose area the frontage exists. The Graphic Plan, however, gives a general guide to the kind of development that should be promoted in each area.

Of the 1,800 miles of waterfront in the Region, 191 miles are in New York City. These 191 miles comprise 44½ miles of factory frontage, 35¾ miles of residential frontage, 31¼ miles of public parks or private amusement parks, six miles of government reservation and 73½ miles of vacant or sparsely built-up areas.[1] There are in

[1] See Regional Survey, Volume V, pages 177–180.

New York City 24 important islands in addition to the large number of islands in the tidal marshes of Jamaica Bay. Nearly all of these are publicly owned. In addition to the ocean and tidal river frontage, the Region includes a great number of lakes and many miles of rivers.

The problem of protecting the beaches comes under two main heads, namely:

(1) The protection of the beach and the upland area adjoining for the purpose of the best economic use of the abutting land and surrounding neighborhoods.

(2) The prevention of erosion and the making of suitable extensions of land areas by filling in submerged lands and shallow bays.

The Regional Plan indicates the general needs in regard to the best use of the frontage land and the places where reclamation of submerged land is most desirable. The regional survey[1] showed that public rights to land under water and to uplands adjoining the water frontage have, in many cases, been alienated to private persons, thus destroying opportunities for conservation needed in the public interest. It is of vital importance that the public not only prevent further alienation of its rights, but that as much upland as is practicable should be acquired, in the right places, for recreation use.

It has been said that the regional survey and the regional plan together form the complete plan. This is especially true in connection with the survey of foreshore and land under water and the proposals for land uses. These should be considered together as indicating the recommendations of the Regional Plan.

It was also pointed out in the regional survey[2] that many of the most accessible beaches have become seriously polluted from sewage, refuse and oil, and that prompt and effective measures must be carried out to remove these menaces if these beaches are to continue in use. Considerable additional public beach is proposed in connection with the waterfront parks proposed on Staten Island and the south and north shores of Long Island.

While extensive proposals have been made in the Plan for utilizing waterfront areas as open space, it is acknowledged that there are greater difficulties in acquiring such land than in acquiring inland areas. An example of this is shown by comparison between the cost of Rye Beach and the cost of the Croton River Parkway in Westchester, which were both purchased by the Park Commission of that county, in April, 1925. Fifty-four acres of Rye Beach, including buildings, cost $2,500,000, or $46,000 per acre, as against $150,000, or $314 per acre, for 478 acres of the Croton River Parkway. This is an extreme case; nevertheless the most valuable beaches are precisely those that are used intensively for private purposes and therefore are the most expensive to acquire. The difficulties of this acquisition are greatly increased by reason of the neglect of public authorities to reserve their old time rights to land

[1] Regional Survey, Volume V, Part IV.

[2] Regional Survey, Volume VIII, Chapters IV, VI and VII.

under water and to acquire the adjoining uplands where they are needed for important commercial uses. It should be part of any city or town plan not only to deal with public responsibilities but to require also that private owners protect the shores from injury and maintain them in proper condition. The problem, of course, is intimately related to that of the pollution of water.

Mr. J. Spencer Smith, Chairman of the New Jersey Board of Commerce and Navigation, states that since the Board came into existence in 1915, large sums have been collected from private owners, as a result of illegal uses of waterways and frontages. The Board has obtained revenues approximating $1,000,000 for such illegal occupations.

Already the cost of acquiring beaches within easy access of the population has become prohibitive in the Region. This makes it all the more important that more distant beaches should be preserved, although they cannot at present be used. As proof of the fact that public reservation of the beach waterfront is the most profitable method of development, the great values created at Atlantic City and Coney Island are examples. One of the greatest assets of Atlantic City is the municipally owned and controlled beach. There are places where the combination of wild land and wild beach would form the most ideal kind of country park.

Utilization of Submerged Land in Central Areas

The Plan contains many proposals for the utilization of submerged lands for purposes of summer residence and recreation. These proposals relate in particular to the more outlying coastal areas, such as those in southern Long Island that lie adjacent to and partly include the shallow south bays. These areas are peculiarly adaptable for pleasure resorts.

In the more central areas, however, the submerged lands are of the highest value for future industrial development. An important group of proposals in the Plan involve the reclamation of water-logged areas lying around the side of navigable bays and rivers. These comprise in the New York area valuable level territory surrounding Jamaica Bay, and forming islands within the Bay. A large proportion of this land in these islands is under water the greater part of the time. It is important that the whole Jamaica Bay section should be planned as a unit in which provision will be made for industry, business, residence and recreation combined—harmonized with suitable port development.

An equally important section is that comprising the Hackensack and Newark meadows, where a bold scheme of reclamation is proposed to be carried out. These meadows provide an enormously valuable site for an industrial community, wherein all its social needs, including residence and recreation, would be met.

A still more central area completely covered with water is that which extends about five thousand feet into the Upper Bay, fronting on the Bayonne Peninsula.

Here there is possibility of creating practically a new city development comprising the most up-to-date system of transportation and building expansion. Other areas include the lands lying on both sides of the Kill van Kull in Staten Island and Middlesex County, New Jersey. The possibilities of these areas can be fully exploited only if comprehensive sectional plans are made for each section, and if the different administrative authorities within whose areas the sections lie combine to plan and develop the land for the right uses. The question of sectional planning of such areas will be dealt with, and illustrations given of their possibilities, in the next volume.

Next to the expansion of the facilities of the Port of New York itself and the development of transportation, the planning and development of the open areas awaiting reclamation near to the center of the Region is perhaps the most important problem, from the point of view of increasing the commerce and industrial opportunities of the Region.

Courtesy, Long Island State Park Commission

INLAND WATERWAYS AT SUNKEN MEADOW PARK, SUFFOLK COUNTY
The park also has an attractive beach frontage on the shore of Long Island Sound.

Photo by P. A. Nyholm

A WESTCHESTER RECREATION CENTER—BATHING PAVILION AND FOOTBRIDGE IN TIBBETTS BROOK PARK

IV. GENERAL RETROSPECT AND SUMMARY

Some Outstanding Developments of Recent Years

IN contemplating the picture presented in the Graphic Plan and described in the foregoing chapters of this volume, the first impression given to the reader may be one of amazement at the expected extent of growth and the cost of meeting its needs. Yet when we look back over the less than thirty years which have elapsed in this century we will be amazed also to find how vast the changes have been and what enormous expenditures have been incurred merely to meet the needs caused by these changes and to maintain progress. It is necessary to mention only a few of the new developments in the last twenty-five or thirty years—broken by four years of world war—to show the astounding power of the Region to re-form and re-create itself.

In recalling a few of these outstanding public improvements we are able to get an impression of what may happen after an equal period when the population may have doubled. Thirty or forty years is a short period in the life of a city, and yet it is long enough to witness a complete reformation in its growth. Full realization of what the last twenty-five years have produced, however, can only come to those who, first having intimate knowledge of the Region, can project their memories back for from twenty to thirty years and visualize what has been accomplished, and, still more, what influences have accrued from these accomplishments.

The significance of these changes is more in their effect on growth and distribution of industry and population than in the simple fact that they have occurred.

A complete record of the major enterprises of a quarter of a century within this Region alone would fill a volume. Their cost, if added, would prove almost as startling as any estimate that might now be made as to the cost of carrying out the projects put forward in the Graphic Plan. There follows a brief reference to some of the outstanding developments.

Rail Transportation and Transit

In the general field of railroad transportation changes in the Region since the beginning of the century have included 351 miles of electrified operation. The Pennsylvania Terminal was opened in 1910 and the new Grand Central Terminal was not completed until 1913.

The first rapid transit subway line in New York City was not opened until 1904, and the Hudson & Manhattan Tubes were opened in 1908. The Manhattan and Queensboro Bridges were both completed in 1909.

Highways

The highway improvements prior to 1900 were largely of a primitive character and were few in number compared to those that have since been carried out. Asphaltic and cement surfaces are inventions of this century and so is the development of

the motor car which has revolutionized road systems and surfaces. In 1902 there were 1,793 miles of paved streets in the City of New York. At the beginning of the year 1929 there were 2,359 miles paved; yet there were still 1,939 miles of unpaved streets. The extension of Riverside Drive north of 155th Street was approved as recently as 1908. The Grand Boulevard and Concourse in The Bronx was not opened until 1909 and the Bronx Parkway, begun in 1913, was only finished in 1923. The development of the Westchester parkway system is the result of less than ten years of work. In 1911 and later it was possible to close Fifth Avenue on a week-day for a Marathon race without serious interference to traffic.

The Holland vehicular tunnel under the Hudson River has been open only two years and the first new bridge connecting Manhattan and New Jersey was begun in 1927 at 178th Street. Two bridges were completed in 1928 between Staten Island and New Jersey and a third one was started in that same year. The first great highway with separated grades is now being constructed from the Holland Tunnel to beyond Newark.

Air Transport

In ten years about 22 landing fields have been constructed in the Region in connection with air transportation. The construction of New York City's first municipal airport, Floyd Bennett Field at Barren Island in Brooklyn, was started in 1928. Mapping of land by aerial photography was only imperfectly developed during the War. Its present standard was achieved only within the last five years.

Buildings

The steel frame structure and the elevator are also twentieth century inventions. Skyscrapers are as modern as the motor car. Their influence has been great but has really only begun to be felt. What effect they have had is small compared to what may be expected. In 1902 there were only 184 buildings of ten stories or more in Manhattan south of 65th Street; by 1925 this number had increased to 935. In all of Manhattan there were in 1924 a total of 1,686 buildings of ten or more stories. Each year since has added many to the number.

Parks

As recently as 1921 there were only 53,071 acres of parks in the Region as compared with over 90,000 acres today. From 1921 to 1927 the park areas in New York City alone were increased 18 per cent. The Westchester County Park Commission, created in 1922, had by April 30, 1928, approved projects calling for the acquisition of 16,671 acres of land and acquired about 95 per cent of this total. By 1928 county park commissions also existed in Essex, Hudson, Union and Passaic Counties, all but the first of these having been organized within the past twenty-five years.

Summary of Principal Proposals on the Graphic Plan

Number of Proposals

It is impossible to give the precise number of proposals included in the description contained in the two preceding chapters, as many of them are composite proposals including several parts and others are listed or referred to twice under different headings. The following is an approximate estimate of the projects listed under the various headings, some being of major and others of more or less minor importance:

	Approximate Number of Proposals Involved
(1) Trunk line railroads	
Belt lines	10
Connections or waterfront lines	19
Union passenger terminals	13
(2) Suburban rapid transit	
First step	5
Completion of ultimate plan	22
(3) New railroad crossings of major waterways	11
(4) Waterway projects and water areas	7
(5) Major regional highways	
Metropolitan loop	3
Inner routes	12
Radial routes	28
Outer circumferential routes	5
Metropolitan by-pass routes	2
Express highways	8
Supplementary routes	29
(6) Minor regional highways	107
(7) Parkways and boulevards	39
(8) Major industrial sites to be developed	14
(9) Extensions of residence areas	12
(10) Proposed public parks in the environs	
Compact park areas	26
Ribbon parks	29
(11) Proposed public parks in New York City	
Compact park areas	28
Ribbon parks	5
(12) Airports and landing facilities	
Proposed additional landing fields	16
Seaplane landings, existing and proposed	20
Total, including a few duplications of proposals	470

Predominant Features

Before presenting a list of specific projects in their order of importance it is well to reiterate certain points which have been brought out in the preceding description and the survey reports as to the predominance of certain major features over others—a matter which has to be considered in determining what most needs to be done.

Port and Transportation Facilities.—The development of the present Port of New

From etching by Anton Schutz

THE FOUR BRIDGES OVER THE EAST RIVER

York is the matter of greatest importance in the planning of the Region, and the comprehensive plans prepared for its extension should be amplified, adopted and carried out. The Plan includes the proposals for extensions of railroads and rapid transit lines so as to indicate the possibilities in regard to these main features of transportation and thereby to enable proper consideration to be given to the relation of these features to the planning of highways and land uses, and vice versa. A proper solution of the transportation problem should provide for electrification of trunk lines, unification of their management, and the creation and operation of belt lines.

FIG. 34

GENERAL PLAN OF THE PROPOSED LAND USES FOR NEW YORK AND ITS ENVIRONS

This illustrates in simplified form the main features of the material shown on Pocket Map No. 3 at the back of this volume.

It is essential that suburban rapid transit should be considered independently of trunk railroad facilities, and it is in this connection that there is probably the greatest demand for new facilities. The suburban rapid transit system should be planned in harmony with the other features of a comprehensive plan of physical growth.

One of the main needs of the Region is the construction of a metropolitan railroad, rapid transit and highway loop. Such a loop should be constructed in a form to make it an attractive corridor, providing in some places for adjoining residential and recreational areas, and in others for industry and business.

Highways.—Comprehensive treatment of the highway system is necessary because highways come under the direct control of municipal authorities and are involved with all questions connected with utilization of land. An important feature of the Plan is that it includes a great many highway proposals already adopted by official bodies, and greatly adds to the value of these proposals by classifying them and co-ordinating them in a complete system.

The proposals shown for marginal ways along the edges of Manhattan and elsewhere are of primary importance. They will be treated in detail as specific projects in Plan Volume II for the purpose of illustrating the great possibilities of the waterfront areas—particularly of the east waterfront of Manhattan and the Harlem River valley.

The Plan shows certain lines of approach by highway to the 178th Street Hudson River Bridge and to the positions proposed for other new bridges and tunnels. It is urgently necessary that these be dealt with on more comprehensive lines than are now contemplated.

Land Uses.—The Graphic Plan, while indicating the adaptability of land for different uses, does not specify precise boundaries and does not deal with the problems of heights, densities and area of occupancy of building. These are matters which do not lend themselves to being placed on a map but are dealt with in Plan Volume II.

It is of vital importance for the future welfare of the communities in the Region that the utmost should be done to promote more spaciousness in all new developments and to conserve as many private open spaces as possible, in the future. In particular it is desirable to discourage conversion of golf courses or large acreage of residential properties into building developments, in those places where there is already other land that is better adaptable for subdivision.

Order of Importance

In presenting any statement regarding the urgency of certain proposals it is recognized that the question of when and whether any particular thing should be done in the public interest must always be subject in practice to the financial expediency and operating convenience of railroad and public utility corporations in connection with the projects in which they are interested, and to political as well as

financial expediency of public authorities. Many circumstances enter into the determination of the time element in carrying out major improvements. All that can be done here is to indicate what is the relative order of importance, if financial and political conditions permit. Subject to these considerations the following are submitted as relatively of the greatest importance:

Trunk Line Railroads

(1) Electrification and the elimination of grade crossings on the West Side tracks of the New York Central Railroad in Manhattan as under negotiation in 1929 between the railroad company and the City of New York.

(2) Extension of the electrification of other main railroad approaches to New York City.

(3) Adoption of the regional railroad plan by the public authorities and railroad corporations.

(4) Development of proposed railroad connections between New Jersey and Brooklyn, including the crossing of the Narrows.

(5) Gradual development of inner and outer belt line system shown on the Plan, including the development of a series of unified terminals and sub-terminals.

Suburban Rapid Transit

(1) The carrying out of the proposed first step of the suburban rapid transit system shown in Fig. 4 (page 196).

(2) Construction of a suburban transit line between Newark and Paterson.

(3) Extension of the first step from southern Manhattan to Brooklyn and from Jersey City to Staten Island.

(4) Connection between Hackensack and northern Manhattan and The Bronx via the Hudson River Bridge at West 178th Street.

Waterway Projects

(1) New Jersey Ship Canal between Raritan Bay and the Delaware River.

(2) Construction of a new basin and waterway forming a navigable alternative to the lower Hackensack River.

Highways and Vehicular Bridge and Tunnel Connections

(1) Tri-borough Bridge between Manhattan, Queens and The Bronx.

(2) Construction of a crosstown highway parallel to the East River, as shown on the Atlas, between the Tri-borough Bridge and the Bay Ridge section of Brooklyn.

(3) Construction of an express route in New Jersey between the Hudson River Bridge and Paterson.

(4) Construction of a Narrows crossing with necessary connections to the Elizabeth and Bayonne Bridges.

(5) Construction of a route, through midtown Manhattan, between Long Island City and the upper Hackensack meadows, including tunnel crossings under the East and Hudson Rivers.

(6) Construction of a crosstown route from the Hudson River Bridge in Manhattan to Westchester Avenue in The Bronx.

(7) Construction of an express highway from the existing express highway in Newark along the west side of the Hackensack meadows to Hackensack.

(8) Extension of waterfront highways around Manhattan.

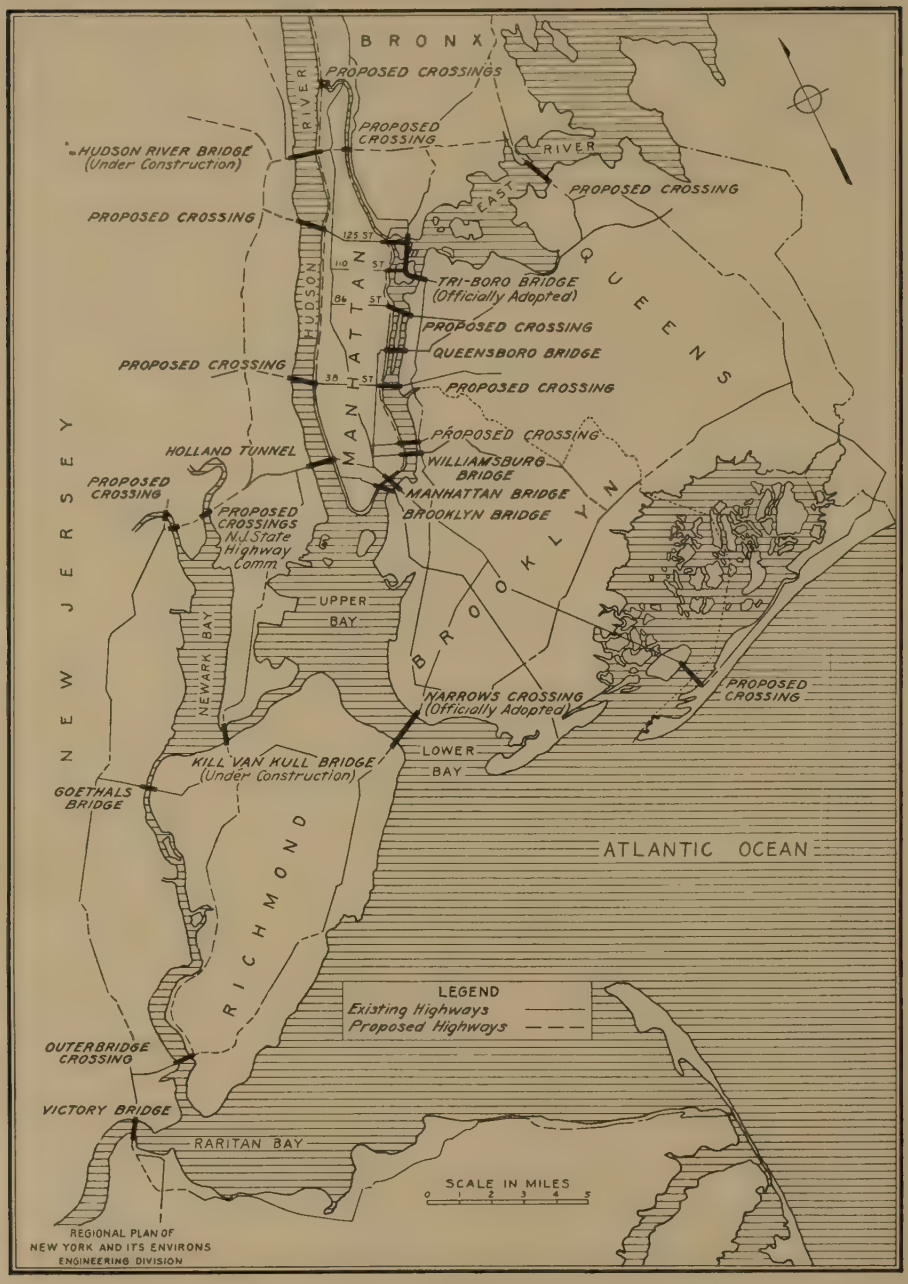


FIG. 35

EXISTING AND PROPOSED HIGHWAY CROSSINGS OF MAJOR WATERWAYS

(9) The carrying out of proposed crosstown parkway and highway routes in Westchester County as follows:

(a) From Yonkers to New Rochelle;

(b) The construction of improved highway and parkway routes between Port Chester and Tarrytown.

(10) A diagonal route from the Tri-borough Bridge along Astoria Avenue and the old Stewart Railroad right-of-way to Floral Park.

(11) The construction of a diagonal connection in Queens from Astoria Avenue to Metropolitan Avenue at Middle Village.

(12) The construction of a circumferential highway in Queens between the head of Jamaica Bay and Whitestone, to be later extended from Whitestone to Old Ferry Point in The Bronx with a connection to Westchester Avenue.

Parkways and Boulevards

(1) The construction of a parkway through the upper middle section of Long Island connecting with Nassau Boulevard and the projected Grand Central Parkway in New York City and extending throughout Long Island to the Half Hollow Hills, with a loop southerly to Belmont Park and Southern State Parkway.

(2) The construction of the following river parkways:

(a) Saddle River;

(b) Passaic River;

(c) Upper Hackensack River;

(d) Raritan River;

(e) The construction of a Parkway from Hudson River Bridge along the top of the Palisades to Sparkill.

(3) An extension of the Westchester County Park system from the Hutchinson River Parkway through Fairfield County to Bridgeport, by-passing to the north the built-up areas in Stamford, Norwalk and Westport.

Metropolitan Loop

(1) Acquisition of right-of-way for a wide corridor to enable the appropriate connections to be made along the line indicated for a Metropolitan Loop, which would include certain connections already listed as parts of the railroad, suburban rapid transit and highway proposals.

Parks

(1) Development of complete park and playground program for the developed portions of New York City, including the allocation of areas in the East River Islands for recreation parks.

(2) Expansion of park system in certain boroughs of New York City, as follows:

(a) Further extension of park areas in Brooklyn on the lands adjoining and islands in Jamaica Bay;

(b) Increase of park areas in Queens to secure adequate acreage to meet the needs of the growing population;

(c) Acquisition of a large central park in Staten Island and of waterfront parks at Great Kills and along Raritan Bay.

(3) Acquisition of areas along the top of the Palisades supplementing the Palisades Interstate Park.

(4) Acquisition of land in the Newark and Hackensack meadows and along the Newark Bay frontage of Bayonne.

(5) Acquisition of areas in the Watchung and Ramapo Mountains with extensions in the lake region in Passaic and Orange Counties, to be used as country parks and for afforestation.

(6) Acquisition of park area comprising mountainous land to the north of Peekskill and forming an extension of Bear Mountain Park from Anthony's Nose to the northeast.

(7) Construction of a park and parkway system from the Raritan River to the Atlantic Coast.

(8) Preservation of the bays and shallow inlets on the southern portion of Long Island, including the construction of narrow parkways as shown on the Plan.

Major Industrial Developments

(1) In New York City:

(a) Further development of areas in The Bronx, along Westchester Creek and along the East River west of the Bronx River, which should be served by a waterfront railroad belt line;

(b) Further development of industrial areas on the west shore of Jamaica Bay as a part of a unified sectional plan for the whole Jamaica Bay area.

FIG. 36

PROPOSED PARK SYSTEM FOR LONG ISLAND

This illustrates regional planning as applied to a sector of the Region.

(2) Combined New York City and New Jersey Areas.—Development of industrial sections along both sides of the Arthur Kill necessitating a railroad waterfront line on the Staten Island side.

(3) New Jersey Industrial Areas.—Filling in of submerged land in Newark and Hackensack meadows and in part of the Upper Bay fronting on Bayonne Peninsula for the development of comprehensive industrial areas.

(4) Development of satellite industrial communities in appropriate locations in the environs, including the areas on both sides of the Raritan River and along the main railroad lines. (Definite suggestions regarding appropriate locations for such communities will be included in Plan Volume II.)

Airports

In addition to the airports already acquired or in course of development, it is suggested as urgent that the following nearby additional areas should be acquired in the near future:

(1) Area comprising part of the marshlands in the southern part of The Bronx.

(2) Development of a major airport in the northern part of the borough of Queens at a site readily accessible from Manhattan.

(3) Development of an airport adjoining Pelham Bay Park.

(4) Development of Governors Island as a major military landing field, with privileges, if possible, for the accommodation of commercial transportation by air.

Other Land Uses

The utilization of land for local purposes of industry, residence, business and recreation, is a matter to be dealt with in local city and village plans. The important thing in this connection is the preparation at an early date of plans to control subdivisions and building development under the planning and zoning laws.

The Plan as a Practical Ideal

The Graphic Plan has been prepared on the basis that administrative as well as economic and physical changes are inevitable, and that there are enormous new developments in prospect for the future which may either create new evils or, by well-conceived planning, both prevent new evils and arrest those with which communities are now confronted.

While the basic plan has been conceived in an endeavor to comprehend future needs, it is conceived also in the belief that the solution of the problems of the present lies in the proper understanding of what these future needs are likely to be. The idea that the problems of today can be solved without study of trends of growth, and planning for the future, underlies much of the inertia of the so-called practical man towards the planning of cities.

Much of the inability to deal with current problems is due to a too prevailing unwillingness to look beyond them to what lies ahead. The policy that needs to be pursued in the interests of posterity is the one that will help most the present generation.

In making the Plan it has not been assumed that the maintenance of present standards of health, safety and convenience will be satisfactory for the increased population in the future. It seems to be inevitable that a population of twenty-one million will need higher average standards of living conditions and of efficiency and economy in the processes of production and government than a population of ten million. So far as new needs and desires are concerned, new measures will no doubt be taken as demands arise to obtain the necessary satisfactions. So far, however, as future demands are occasioned by acceleration of growth and by new inventions as well as by the combined results of increased expansion over wider areas—it will be impossible to introduce measures in the future to adequately overcome the evils that will arise from failure to lay the right foundations now in advance of growth. With the prospects that are in view it may be anticipated that as the population increases the quality of artificial environment of the urban areas must be raised.

The question of what is practical depends as much on what is permissible under the law as it is, or may be made, as it does on what is financially feasible. In a regional plan, however, we are more concerned with what the law ought to permit to meet conditions as they are likely to arise in the future than with what is now

authorized by the law. Such a plan should be based on the principles stressed by Edmund Burke on "American Taxation": "It is not what a lawyer tells me I *may*, but what humanity, reason and justice tell me I *ought* to do." In the future the people will determine what law and interpretations of police power are fitted for conditions that will then arise.

At the same time we have to base our expectations of a broader law on the general principles laid down in the existing law and in the best judgments of the courts. As a general principle we may accept as sound the view expressed in a judgment in the courts of Massachusetts, namely, that "the absolute right of the individual must yield to and be modified by corresponding rights of other individuals in the community. The resulting general good of all, or the public welfare, is the foundation upon which the power rests."[1]

On this broad basis we may anticipate that, where needed, the law will be changed so as to secure any reasonable restriction of the rights of private owners or of one part of the public, or to modify the rights of individuals or corporations in their mutual relations so that the general welfare of the whole community will be obtained. The Regional Plan must seek to set up a conception of what is best for the community under conditions as they are likely to be in the future, and leave it to the good sense and sound judgment of future generations to modify the law in accordance with the above principles. Even if the proposals are mistaken in their conception of what is best they should not be circumscribed by considerations of that which is only now practicable.

It is difficult to suggest a program that depends for the support needed to carry it out on a more intelligent public opinion than now exists, and yet is limited in the ideal it seeks to achieve by those practical considerations that must always keep collective effort from achieving a high degree of perfection in artificial growth. Because of this the Plan may fail to satisfy either the practical man who thinks mainly of the immediate present or the idealist who dreams of a perfect future.

Thus the Plan will appear to some to be too idealistic in its conception of what is needed, while to others it will appear to be lacking in true vision.

Generally speaking, planning may be inspired by one of three policies. The two that are easiest to follow in planning for the future are, first, that practical policy which does not extend beyond the concrete and the present, and second, that idealistic policy that is based solely on the abstract and the future. Under the former policy proposals are made to flow with the current created by established habits and vested interests; and under the second they are confined to what ought to be, without regard to the limits imposed by unalterable conditions. The one policy lacks soul, and the other flesh and blood, and those who follow them find planning a simple exercise.

[1] Lowell *vs.* Boston, 111 Mass. 454; St. of 1872, c. 364.

The third, which seeks an ideal based on realities—an ideal shaped by the processes of reason and not by the play of fancy—involves the greater labor but seems to present the only possibility for improving conditions of life and society. Such an ideal in regional or city planning has regard to circumstances as they now are in the city, but also must be alert to seize the openings towards better things that appear on the horizon of the future. An ideal, to be a worthy one, must be capable of being expressed in action; and it must be action based on a study of future trends and possibilities as well as of past events. To make an ideal real, we must believe it is a good thing to do, but also that it can be done. Because of this, a plan may appear to be of the highest quality in the sphere of what is attainable and yet of comparatively poor quality in the sphere of what is desirable in the abstract. Life offers ample scope for achievement within the realms of the practical, and greater satisfaction comes from conceiving the smaller things that can be done than in dreaming of the larger things that cannot be done.

On this basis a plan for an urban region must present a picture of possibilities within the limits of reasonable anticipation of what the collective intelligence of the community will accept and promote. This raises as a final issue the importance of education of the public with regard to their responsibilities in civic affairs.

Education and Civic Spirit

The success of any plan depends on education—the development of knowledge and understanding of the underlying causes of bad conditions, and of the need of exercising foresight by planning for the future; the development, too, of civic pride and a desire to make the city a place where natural and structural beauty are cherished and protected from destruction.

People take pride in local places within the city and in many cases the unit for social and civic endeavor is a street rather than a district. Neighborhood unity is a good thing, but the satisfaction to be obtained from it depends on qualities of environment and facilities for communication that can only be secured by working through and with the whole city or Region.

The causes of bad conditions concerning which public opinion most needs to be educated are the recent or present-day causes, rather than those that would have to be sought in our long-past history. Indifference to the dangers which the hour is breeding is usually the culpable element that makes trouble for the next decade. Modern inventions which have been popularized within the last thirty years have altered city living conditions very greatly and will modify them still further. It is possible to predict some of the approaching modifications quite confidently. Some are to be looked forward to with apprehension. Concerning these the popular imagination must be aroused and instructed, if effective preventive measures are to

be taken. This cannot be done successfully by the mere repetition of warnings and pessimistic prophecies. There must be a vision of what is to be desired as well as of what is to be feared. Ideals worthy of a proud community are necessary to move the New York region to efforts worthy of its power.

Courtesy, Union County Park Commission

BRIDLE PATH IN WATCHUNG RESERVATION, UNION COUNTY

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